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Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

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LUDLOW GRISCOM
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Vol. 42. September, 1940. No. 501.

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The New England Botanical Club, Inc.
8 and 10 West King St., Lancaster, Pa.
Room 1001, 53 State St., Boston, Mass.

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RHODORA.—A monthly journal of botany, devoted primarily to the flora of New England. Price, $2.00 per year, net, postpaid, in funds payable at par in United States currency in Boston; single copies (if available) 20 cents, numbers of more than 24 pages or with more than 1 plate at higher prices. Volumes 1–8 or some single numbers from them can be supplied only at advanced prices which will be furnished on application. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be considered for publication to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than two pages of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscripts and proofs to
M. L. Fernald, 14 Hawthorn Street, Cambridge, Mass.

Subscriptions (making *all remittances* payable to RHODORA) to

Ludlow Griscom, 8 W. King St., Lancaster, Pa., or Museum of Comparative Zoology, Cambridge, Mass.

Entered at Lancaster, Pa., Post Office as Second Class Mail Matter.

INTELLIGENCER PRINTING COMPANY
Specialists in Scientific and Technical Publications
EIGHT WEST KING ST., LANCASTER, PA.

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Gray Herbarium of Harvard University, Cambridge, Mass.

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXXXII

A LIST OF PLANTS FROM INTERIOR ALASKA[1]

Edith Scamman

Of the great territory of Alaska—in extent equal to one-fifth the size of the United States—the Interior has received little attention from botanists. In Southeastern Alaska, the Aleutian Islands, and the Bering Sea region, many collections have been made and reports published, since the earlier years of Russian occupancy. Ledebour's "Flora Rossica" remains today a most valuable work for all students of Alaskan plant life.

But the vast Interior, cut through by the Yukon River—a natural highway for the gold seekers and adventurers of early days—and its drainage system, including the valleys of the Tanana and the Koyukuk Rivers, with Mt. McKinley Park as the southern boundary, contains a great wealth and variety of plants. Much of the region is unglaciated, except locally, and has, therefore, afforded a safe and secure home in which plant species have lived undisturbed for countless ages. On the mountains of this old region may be found growing in close proximity arctic-alpine plants, many circumpolar, cordilleran species of the Rocky Mts. and British Columbia, and Asiatic types, "transgressing" seven or eight hundred miles inland from the coast of Bering Sea. The distribution of plants in the Interior is, therefore, of considerable interest, and this list includes new localities and extensions of range for many species.

[1] Cost of publication defrayed by the author.

The summers of 1936 and 1937 were spent by the writer in Alaska for the purpose of collecting specimens for the Gray Herbarium. Small collections were made in Juneau and Seward, but are excluded here, as this list covers only vascular plants of the Interior, obtained from a number of different localities: Mt. McKinley National Park; Black Rapids, on the Richardson Highway, extending from the coast to Fairbanks; Fairbanks; Miller House, Eagle Summit, and Circle Hot Springs, all three near the Steese Highway, the only road from Fairbanks, the metropolis of the Interior, to Circle City on the Yukon; and Wiseman, the "Arctic Village" on the Middle Fork of the Koyukuk. The stations in this area extend from McKinley Park, 63° 43′ no. lat., to Wiseman, about 67° 30′ no. lat.

Mt. McKinley Park

Two visits were made to the Park, one of three days only, July 5–7, 1936, and a longer period, June 13–22, in 1937. Spring was late in Alaska in 1937, and when I reached Savage River Camp, twelve miles from the railroad entrance to the Park, on June 13th, practically nothing was in bloom. From a collector's point of view it looked quite hopeless. But several days of warm weather with sunshine much of the night, causing underground ice to thaw and surface snow to melt, resulted in an almost unbelievable transformation. The stony banks of the Savage River, with swamp sand beyond, and open, parklike woods behind the Camp, were masses of brilliant color—Silene, Anemones (four species), Delphinium, Aconite, Papaver, Parrya, Drabas, Saxifragas, Dryases, Potentillas, Rhododendron, Lupine, Dodecatheon, Mertensia, and Polemonium. As I was eager to get farther north, I remained in the Park only long enough to collect 115 species. The majority of these were obtained within two or three miles of the Camp. A day's trip to the Rangers' cabin at Igloo, Sable Pass and Polychrome Pass yielded a few less common finds—*Viola biflora, Draba alpina, Potentilla nivea* and, on a rock pile near Sable Pass, *Astragalus falciferus* and several critical species of *Oxytropis*. A clump of pinkish-purple *Douglasia* in bloom at Polychrome Pass was the chief reward for the days spent at the Park.

Rapids

An impressive demonstration of the forces of nature was staged at Rapids on the Richardson Highway between my two visits there, August 7–10, 1936, and August 25–28, 1937. The Hunting Lodge is

situated on the Big Delta River, 138 miles south of Fairbanks, on the northeastern slopes of the Alaska Range, elevation 2130 feet. In 1936 a small glacier could be seen from the Lodge, merely as a glittering spot of ice high up in the mountains. A year later it had become a "runaway" glacier, had moved downward five miles, taking shrubs and all other vegetation with it, and stopped, a great wall of ice 300 feet high, on the opposite bank of the Big Delta.

On a dry, rocky bluff near the river a new variety of *Lesquerella arctica* grew in abundance. Tiny, low-growing *Saxifraga Eschscholtzii*, and *Woodsia alpina* and *Crepis nana* were also collected at Rapids, with other plants one would expect to find in the two habitats—spruce and birch woods bordering the swift-flowing glacial streams, and the mountain-sheep "pastures" at higher altitudes above the tree line.

Miller House

A brief acquaintance with the plants of Eagle Summit, seven miles from Miller House, in 1936, made me realize the fine possibilities for collecting arctic-alpine plants there. So I returned the following year, happy to be back with my kind, hospitable friends, Mr. and Mrs. Frank Miller. There in a tiny log cabin next door to the roadhouse, post-office, and general store—all three in one—I remained from July 2 to 26. In the center of the "Circle diggings," 116 miles north of Fairbanks, this roadhouse is located in a valley, through which flow several mining creeks, Mammoth, Mastodon, and Miller.

Plants typical of the Interior valleys of an elevation of about 2000 feet were found here. Large clumps of the rusty-backed swords of *Dryopteris fragrans* shared the dry hillsides above the creeks with *Arctostaphylos Uva-ursi* and *A. rubra*, *Vaccinium Vitis-Idaea*, var. *minus* (Mountain Cranberry), *Empetrum nigrum*, *Pedicularis labradorica*, *Geocaulon lividum*, *Silene repens*, *Arnica attenuata*, *Saxifraga tricuspidata* and *Arenaria obtusiloba*. In the open tundra below were white pools of *Eriophorum* with *Carices*, *Andromeda polifolia*, *Vaccinium uliginosum*, *Rubus Chamaemorus*, *Polygonum viviparum*, and the straight pink plumes of *P. Bistorta*. *Parnassia Kotzebuei* and *P. palustris*, var. *neogaea*, *Linnaea borealis*, and tangled *Hedysarum alpinum*, var. *americanum* were sheltered by willows and alders in moist shady spots. Flat patches of *Arenaria physodes* were abundant, and delicate *Crepis elegans*, with long tap-root, penetrated the spaces between the piles of round stones thrown up by mining operations. Along the

lower part of the trail from Miller House to Eagle Summit shrubs and tall, weed-like plants of the familiar roadside association flourished luxuriantly—*Rubus idaeus*, var. *canadensis*, *Potentilla fruticosa*, *Rosa acicularis*, *Senecio lugens*, *Aster sibiricus*, *Solidago multiradiata*, *S. decumbens*, *Polygonum alpinum*, var. *lapathifolium* and *Epilobium angustifolium*. The latter is the most striking and conspicuous plant in the Interior, covering the low hills around Fairbanks with masses of brilliant color, visible for miles.

Eagle Summit

An Alaskan "travelogue" describes Eagle Summit, elevation 3880 feet, as a barren summit, the highest point on the road between Valdez on the southwestern coast to Circle City on the Yukon. The extreme top is level, with disintegrated rock fragments, dry and barren, indeed. In winter it is bleak, wind-swept, and bitterly cold, and is considered one of the most difficult places to cross by dog team. But in July all the cave-like hollows and wet slopes form an alpine rock garden of great beauty. Large snow patches remain nearly all summer between the slopes—a favorite place for caribou to seek refuge from mosquitos and flies, as well as from the heat. The borders of wet, springy ground where water trickles down from the snow afford a perfect home for *Ranunculus nivalis*, also *Claytonia sarmentosa* and *C. tuberosa*, *Senecio Kjellmanii*, *Saxafraga Hirculus*, *S. foliolosa*, *Dodecatheon frigidum*, *Parrya nudicaulis*, *Cardamine purpurea*, and numerous others.

Slightly higher in the rocky crannies grow different species—two dwarf *Salices*, *Oxyria digyna*, *Arenaria arctica* and *Arenaria macrocarpa*, *Silene acaulis*, var. *exscapa*, *Ranunculus pygmaeus*, *Anemone narcissiflora*, *Cardamine bellidifolia*, *Saxifraga rivularis*, *S. punctata*, *S. bronchialis*, subsp. *Funstonii*, *Dryas octopetala*, *Cassiope tetragona*, *Gentiana glauca*, *Arnica Lessingii*, *Saussurea densa*, and *Antennaria alaskana*. Five species of *Pedicularis* were close neighbors in spongy ground near the base.

It was a delight to discover several rarer plants—*Campanula uniflora*, inconspicuous and easily missed; fragrant and charming *Eritrichium aretioides;* a pink and white *Papaver*, *Oxytropis Mertensiana*, the first record for the Interior and third for Alaska; and *Eutrema Edwardsii*, known usually from the northern coast. Here on the slopes of Eagle Summit circumpolar, Asiatic or North Pacific, and cordilleran species lived side by side.

Porcupine Dome

The red letter day of my two Alaskan summers came on July 12, 1937, when Mr. Miller and I climbed Porcupine Dome, the highest peak, elevation 4810 feet, of the whole region between Fairbanks and the Yukon. Wearing high rubber boots, our faces hidden by mosquito netting, and armed with a gun, for protection against unfriendly bears, we made slow progress across the "niggerheads." Our hike ended with a climb almost on hands and knees over the massive rock-pile to the flat plateau which formed the top of the Dome. There growing beside *Salix phlebophylla* and *Antennaria alaskana,* was a delicate little *Potentilla,* glabrous, with three-foliolate leaves. It proved to be *Potentilla elegans,* a rare plant of the mountains of Siberia, reported but once before on the North American continent, on the coast. Here it was more than 600 miles inland. It bears a close resemblance to a rare endemic of the White Mountains.

Potentilla biflora, found occasionally on the northwest coast, but rare in the Interior, had been collected on the way up. At a lower altitude in wet, springy ground below a snow patch were a few plants only of a single-flowered, purplish-magenta *Claytonia*—very characteristic and unlike any *Claytonia* I had seen either in the field or in the herbarium. This new species—recently described by Dr. Eric Hultén—and *Potentilla elegans* were enough thrills for one day, even though we missed meeting a grizzly.

Circle Hot Springs

This is the chief resort of Interior Alaska, 9 miles southeast of the Steese Highway and about 138 miles north of Fairbanks. The hot baths of healthful mineral water are very popular, as are also the fine vegetables grown in the neighborhood of the springs in the hotel garden. Plants with a more southern range are found here, growing luxuriantly around the springs, in spite of the nearness to the Arctic Circle. I spent only several days at the Hot Springs in 1936 (July 17–22), but was repaid by finding *Juncus filiformis,* not previously reported from Alaska, and northern extensions of range for several plants. *Caltha natans,* of rare and local distribution, grew in ditches with *Ranunculus Purshii,* subsp. *yukonensis.*

Wiseman

Wiseman is a small village of Eskimos and gold miners, on the Middle Fork of the Koyukuk, about 75 miles north of the Arctic

Circle. It is reached by a plane trip of 200 miles from Fairbanks. One night in 1936, July 12, I flew there and back to view the midnight sun, picking up a few common plants in the town. But most of my specimens, the first collected or recorded from Wiseman, were obtained from August 2–12, 1937. It was late in the season for the best collecting, however.

The river valley and ravines are well wooded with *Picea, Populus tacamahacca* and *Betula papyrifera,* with *Populus tremuloides* on higher altitudes in the hills. *Juniperus communis,* var. *montana* is occasional and *Betula glandulosa* very common, as it is everywhere throughout the Interior. Three Orchids grew abundantly in the woods about the town—*Cypripedium passerinum, Habenaria obtusata* and *Habenaria hyperborea. Spiranthes Romanzoffiana* was occasionally found, probably the most northern station on record. *Boschniakia rossica,* called "corn pipes" by the Eskimo children, is very plentiful. Masses of *Dryas Drummondii,* with beautiful feathery styles, lined "Main Street," and *Epilobium latifolium* gave color to the river bars. Three unusual "finds" were true *Oxytropis deflexa,* the second station in Alaska; the rare *Antennaria pulcherrima,* and *Artemisia alaskana.* This is the only report of the latter, with the exception of the type specimen from the lower Yukon. Most of the Wiseman plants are noticeable for their unusually tall growth, due probably to the rapid forcing by so many hours of sunlight.

A few specimens, labelled "Along the Yukon River," were collected when the steamer stopped to load at various wood-piles between Tanana and Eagle, August 20–27, 1936. *Astragalus yukonis* from Tanana is the most noteworthy.

The material from Fairbanks is scanty and not representative, as I gathered plants there only while waiting to go on to other places, so missed some, well-known and common. I have also included several from Curry, on the Alaska R. R. between Anchorage and the Park, too far south to be classed as truly in the Interior.

While in Alaska I appreciated the courtesy shown me by Professor Gasser of the University at Fairbanks, Mrs. Ada Sharples of Juneau, author of a popular Flora of Alaska, and Mr. J. B. Anderson, who kindly offered me while in Juneau, the use of his private herbarium, containing the largest and finest collection of Alaskan plants in the Territory.

My deepest appreciation is expressed to Professor Fernald for his generous encouragement, kindly interest and helpful guidance, without which this study of flora of the Alaskan Interior could not have been undertaken.

On a visit to the Gray Herbarium in 1938, Dr. Eric Hultén of Lund looked over many of my specimens, giving me valuable aid in their identification and record of distribution. He also took several critical species back to Sweden for later study, and has since kindly described and named the new Claytonia.

"Contributions to the Flora of Alaska," by A. E. Porsild, of Ottawa, in RHODORA, 1939,[1] has been a constant guide and inspiration. To him I am greatly indebted for identifying and annotating a number of my puzzling specimens, and for his generous and helpful advice in regard to this list.

It is a pleasure to express my gratitude to Mr. C. A. Weatherby for his assistance in the classification of the *Pteridophyta;* to Dr. Hugh M. Raup, the *Salices;* to Mr. Reed Rollins, the *Cruciferae;* and to Dr. G. Haglund, the *Taraxaca.*

LIST OF VASCULAR PLANTS COLLECTED IN INTERIOR ALASKA
(407 species and varieties, 847 numbers)

I. PTERIDOPHYTA

BOTRYCHIUM LUNARIA (L.) Swartz. Not common and seen only once. It may easily have been overlooked, however. Rapids, no. 28.

WOODSIA ILVENSIS (L.) R. Br. On exposed dry cliffs above the Susitna River. Curry, nos. 2 and 565.

W. ALPINA (Bolton) S. F. Gray. Crevices in rocks overhanging Gunnysack Creek. Rapids, no. 1.

Plants in this collection have straw-colored stipes, as is often the case in typical *W. alpina* of the Old World, which in all other characters they resemble.

W. GLABELLA R. Br. Frequent around Wiseman on moist rocks and in damp, mossy hollows shaded by overturned tree roots, no. 871.

CYSTOPTERIS FRAGILIS (L.) Bernh. Abundant in shaded ravines. This semicosmopolitan fern grows luxuriantly in many places. Park, no. 575; Rapids, no. 4; Circle Springs, nos. 3 and 6.

PTERETIS NODULOSA (Michx.) Nieuwl. *Onoclea nodulosa* Michx. In alder thickets along the Susitna River, sometimes reaching the height of six feet. Curry, no. 564; Fairbanks, no. 7.

DRYOPTERIS FRAGRANS (L.) Schott. *Thelypteris fragrans* (L.) Nieuwl. Apparently the most common fern of the north-central In-

[1] Porsild, A. E., RHODORA 41: 141–183, 199–254, 262–301 (1939).

terior. At Miller House hundreds of plants grow on dry, stony hillsides, nos. 15 and 700; Park, no. 574; Circle Springs, no. 14; Wiseman, no. 872.

D. SPINULOSA (O. F. Müll.) Watt, var. DILATATA (Hoffm.) Watt. See Fernald, Contrib. Gray Herb. **76**: 147 (1926), for discussion of *D. spinulosa* and *D. austriaca*. Common in southern Alaska along the coast, but rare in the central Interior. Circle Springs, no. 17.

D. SPINULOSA (O. F. Müll.) Watt, var. AMERICANA (Fisch.) Fernald, in RHODORA **17**: 48 (1915). Rare. Circle Springs, no. 16. Scales on stipe and a few on rachis, pale brown, concolorous.

D. PHEGOPTERIS (L.) C. Chr. *Phegopteris polypodioides* Fée; *Thelypteris Phegopteris* (L.) Slosson. Common in southern Alaska, but rare in the Interior. Rich woods by the river. Curry, no. 12.

D. LINNAEANA C. Chr. *Phegopteris Dryopteris* (L.) Fée; *Thelypteris Dryopteris* (L.) Slosson. Rare in cool, moist woods. Circle Springs, no. 10; Wiseman, no. 913. These specimens have a few glands on the rachis, and belong with forma GLANDULOSA Tryon in Fern Jour. **29**: 4 (1939).

ATHYRIUM FILIX-FEMINA (L.) Roth ex Mertens, var. SITCHENSE Rupr. ex Moore. Abundant and of tall, luxuriant growth near the hot springs. Circle Springs, no. 19. Forma STRICTUM (Gilbert) Butters, no. 20.

EQUISETUM ARVENSE L. Common and widely distributed. Fairbanks, no. 34; Miller House, no. 30; along Yukon River, no. 31; Wiseman, no. 29.

E. PRATENSE Ehrh. In willow and poplar thickets along banks of sloughs. Fairbanks, no. 1082.

E. SYLVATICUM L. See Fernald in RHODORA **20**: 129 (1918). Often in woodland. Park, no. 576; Fairbanks, no. 33; Circle Springs, no. 32.

E. PALUSTRE L. Abundant on mud bars and in shallow water. Fairbanks, no. 860; Wiseman, no. 873.

E. FLUVIATILE L. In sloughs and ponds. Fairbanks, nos. 34-a, 860-a; Miller House, no. 702.

E. VARIEGATUM Schleich. Occasional along borders of creeks. Miller House, no. 701; Wiseman, no. 874.

LYCOPODIUM SELAGO L. Frequent on mossy ledges in alpine situations. Park, no. 577; Rapids, no. 1044; Eagle Summit, nos. 35, 703.

L. ANNOTINUM L. Damp, rich woods. Rapids, no. 1043.

L. ANNOTINUM L., var. PUNGENS (La Pylaie) Desv. In drier places. Eagle Summit, nos. 37, 704; Circle Springs, no. 36; Wiseman, no. 876.

L. CLAVATUM L. Park, no. 578. Var. MONOSTACHYON Grev. & Hook. On dry ledges in hillside graveyard. Wiseman, nos. 40, 877.

L. COMPLANATUM L. Circle Springs, no. 41; in open woods on higher slopes, Wiseman, no. 875.

SELAGINELLA SIBIRICA (Milde) Hieron. See Hultén, Fl. Aleut. Isl. 62 (1937). On dry, bare cliffs. Wiseman, no. 878.

II. Spermatophyta

Gymnospermae

Picea glauca (Moench) Voss, and Picea mariana (Mill.) B.S.P. constitute the coniferous forests of the Interior.

Larix laricina (DuRoi) Koch. Occasional in swamps. Fairbanks, no. 43.

Juniperus communis L., var. montana Ait. *J. sibirica* Burgsd. On dry, gravelly slopes, not common. Park, no. 579; Wiseman, no. 879.

Angiospermae

Monocotyledonae

Triglochin palustris L. Common in marshes and along the rivers. Fairbanks, no. 46; Wiseman, no. 880.

Phalaris canariensis L. Introduced. Fairbanks, no. 1087.

Hierochloë odorata (L.) Wahlenb. Park, no. 580.

H. alpina (Sw.) Roem. & Schult. On alpine summits. Park, no. 581; Eagle Summit, no. 706.

Arctagrostis arundinacea (Trin.) Beal. In the hills above Wiseman, no. 881.

A. latifolia (R. Br.) Griseb. Miller House, no. 709.

Agrostis scabra Willd. Circle Springs, no. 48.

Calamagrostis canadensis (Michx.) Nutt., var. Langsdorffi (Link) Inman. *C. Langsdorffii* Trin. See Rhodora **24**: 143 (1922), and **32**: 43–44 (1930). Very common. Rapids, nos. 49, 1049; Miller House, no. 710; Wiseman, no. 882.

Deschampsia caespitosa (L.) Beauv. Fairbanks, no. 50.

Trisetum spicatum (L.) Richter. Miller House, no. 53.

Beckmannia Syzigachne (Steud.) Fernald in Rhodora **30**: 27 (1928). Widespread and common. Miller House, no. 707; Circle Springs, no. 54; Wiseman, no. 883.

Poa alpina L. Stony soil. Park, no. 604.

P. arctica R. Br. *P. rigens* Hartm. In alpine situations. Eagle Summit, nos. 55, 710-a.

P. alpigena (Fries) Lindm. Miller House, no. 708.

Glyceria grandis Wats. In sloughs about the Chena. Fairbanks, no. 56.

Festuca rubra L. Varies greatly. Rapids, no. 1050.

F. altaica Trin. Miller House, no. 705.

Bromus Pumpellianus Scribn. In dry ground around cabins. Fairbanks, no. 1086.

Agropyron latiglume (Scribn. & Sm.) Rydb. Rapids, no. 1053.

Hordeum jubatum L. Abundant around towns. A nuisance in Fairbanks where it grows everywhere along the sidewalks and in vacant lots. Tanana, no. 58; Wiseman, no. 885.

Elymus innovatus Beal. Common in dry fields and on the edges of woods. Rapids, nos. 60, 1052; Wiseman, no. 884.

Eriophorum opacum (Björnstr.) Fernald in Rhodora **7**: 85 (1905); **27**: 203–10 (1925). Very common in swampy ground. This and the following species form large "niggerheads" in the tundra. Park, no. 587; Circle Springs, no. 65; Wiseman, no. 888.

E. vaginatum L. Miller House, no. 713.

E. callitrix Cham. Occasional in bogs and along the edges of small ponds. Miller House, no. 712; Circle Springs, no. 63.

E. Scheuchzeri Hoppe. Miller House, no. 711; Wiseman, no. 887.

E. medium Anders. *E. Chamissonis* C. A. Meyer, var. *albidum* sensu Fernald. Rapids, no. 1048.

E. angustifolium Roth. Widespread and abundant in wet places. Miller House, no. 714; a larger form, no. 715; Circle Springs, no. 64; Wiseman, no. 889.

Scirpus americanus Pers. Circle Springs, no. 61.

Carex capitata L. Rare. In swamp near Fairbanks, no. 692.

C. disperma Dewey. *C. tenella* Schkuhr. Beside creek at Miller House, no. 718.

C. brunnescens Poir. Fairbanks, no. 693.

C. supina Wahlenb. Rare. Rapids, no. 1045.

C. scirpoidea Michx. Common. Park, no. 585; Rapids, no. 1046; Circle Springs, no. 69; Wiseman, no. 991.

C. scirpoidea Michx., var. convoluta Kükenth. Miller House, no. 719.

C. concinna R. Br. Park, no. 583.

C. capillaris L. Occasional on mossy banks. Rapids, no. 72; Wiseman, no. 886.

C. angarae Steud. Synops. Cyper. 190 (1855). *C. Vahlii* Schkuhr, var. *inferalpina* sensu Fernald in Rhodora **35**: 220–223 (1933), non Wahlenb. Very common. Rapids, no. 1047; Miller House, no. 717; Circle Springs, no. 75.

C. stylosa C. A. Meyer. Wiseman, no. 992. Probably first record for the Interior.

C. podocarpa R. Br. Park, no. 582; Eagle Summit, no. 720-A.

C. Tolmiei Boott. Park, no. 586; Miller House, no. 722.

C. atrosquama Mackenzie. Miller House, no. 725.

C. aquatilis Wahlenb. Common in swamps and along creeks and rivers. Miller House, no. 716; Circle Springs, no. 80; Wiseman, no. 993.

C. physocarpa Presl. Miller House, no. 724.

C. membranacea Hook. *C. membranopacta* Bailey. Common. Park, nos. 84, 584; Rapids, no. 85; Miller House, no. 723; Circle Springs, no. 83; Wiseman, no. 995.

C. rotundata Wahlenb. In low, marshy ground. Wiseman, no. 996.

C. rostrata Stokes. In a ditch in Fairbanks, no. 87.

Juncus bufonius L. Frequent along paths or roadsides. Fairbanks, nos. 89, 1085; Circle Springs, no. 88.

J. BALTICUS Willd., var. HAENKII (E. Mey.) Buch. Common in wet places. Park, no. 591; Fairbanks, no. 90; Wiseman, no. 998.

J. FILIFORMIS L. Rare. The first station for this slender *Juncus* reported in Alaska. Circle Springs, no. 93.

J. ALPINUS Vill. Fairbanks, no. 94.

J. CASTANEUS Smith. Abundant and widespread in the Interior. The most common Juncus in the places I visited. In marshy ground. Fairbanks, no. 96; Miller House, no. 726; Circle Springs, no. 95; Wiseman, no. 999.

LUZULA PARVIFLORA (Ehrh.) Desv. Alpine slopes. Park, no. 589.

L. CONFUSA Lindeb. Also an alpine species. Miller House, no. 729.

L. MULTIFLORA (Retz.) Lej. *L. campestris* (L.) DC., var. *multiflora* (Ehrh.) Čelak. Park, no. 588. Var. FRIGIDA (Buch.) G. Sam. *L. campestris*, var. *frigida* Buch. See Hultén, Fl. Aleut. Isl. 125 (1937). Miller House, no. 728.

L. JAPONICA Buch. Park, no. 590.

TOFIELDIA PALUSTRIS Huds. *T. minima* (Hill) Druce. Very common all through the central and northern Interior. Miller House, no. 102; Eagle Summit, no. 730; Circle Springs, no. 101; Wiseman, no. 890.

T. COCCINEA Richards. Found occasionally in higher, more alpine situations. Rapids, no. 103; Eagle Summit, no. 731.

ZYGADENUS ELEGANS Pursh. Abundant in grassy plains and thin, open woods. Rapids, no. 106 (in fruit), no. 1005 (in flower); Wiseman, nos. 105, 891.

ALLIUM SCHOENOPRASUM L., var. SIBIRICUM (L.) Hartm. *A. sibiricum* L. Occasional on sandy shores. On banks of the Yukon, Rampart, no. 107.

LLOYDIA SEROTINA (L.) Reichenb. This delicate little "Alp Lily" is rare in the mountains. A good-sized colony along the rocky shore of Savage River, Park, no. 592. A single plant was seen in a crevice at Eagle Summit.

IRIS SETOSA Pall. A tall, beautiful purplish-blue *Iris*, abundant along roadside ditches and on marshy ground in Fairbanks, no. 110 (in fruit), no. 688 (in flower).

CYPRIPEDIUM PASSERINUM Richards. Abundant in spruce woods along the Koyukuk River, Wiseman, no. 892.

As I was there in August my specimens were all in fruit, but the following year Tom Brady, a miner of Wiseman, sent me several in flower, no. 892-A.

C. GUTTATUM Swartz grows in Fairbanks. I saw mounted specimens there, but did not collect it myself.

? HABENARIA SP.

These plants, growing in marshland in Wiseman, no. 894, seem to

belong to the *Habenaria hyperborea* or *H. dilatata* group, as the lip is entire, about 5 mm. long, broader at the base and slightly dilated. Basal leaves are rather wide and obtuse, and the flowers greenish-white.

H. OBTUSATA (Pursh) Richards. Occasional in rich woods. Rapids, nos. 112, 1006; Wiseman, no. 893.

SPIRANTHES ROMANZOFFIANA Cham. & Schlecht. Rather rare and local. Circle Springs, no. 113; Wiseman, no. 895.

Several plants were found in moist ground on hills above the town. This is probably the most northerly station ever recorded for *S. Romanzoffiana*.

CALYPSO BULBOSA (L.) Oakes. A mounted specimen, collected along the Steese Highway, was seen at the Tanana Valley Fair in Fairbanks.

DICOTYLEDONEAE

POPULUS TREMULOIDES Michx. The aspen is common in dry soils throughout the Interior. Here and there in the hills above Wiseman, no. 897.

P. TACAMAHACCA Miller. *P. balsamifera* DuRoi, not L. See Jour. Arn. Arb. **10**: 55 (1929). Common on flood plains along creeks and rivers. Miller House, no. 114; on the banks of the Koyukuk, Wiseman, no. 896.

SALIX RETICULATA L. One of the most common prostrate willows in the hills of the Interior. Park, nos. 115, 595; Rapids, no. 116; Wiseman, no. 903. The two latter belong to var. ORBICULARIS (Anders.) Floderus.

S. ARCTICA Pallas. *S. crassijulis* Trautv. Common in alpine regions. Park, nos. 118, 594 (Savage River Camp), 600; Paxson, no. 119.

S. ROTUNDIFOLIA Trautv. Eagle Summit, no. 735.

This small willow with bright green, round leaves and short pistillate catkins is rare in the mountains.

S. PHLEBOPHYLLA Anders. Growing in mats on bleak, bare mountain summits. Porcupine Dome, no. 736.

The stems of this species are crowded with skeletonized leaves.

S. PSEUDOPOLARIS Floderus. Rare. Eagle Summit, no. 117.

S. STOLONIFERA Coville. Eagle Summit, nos. 120, 737.

A low-growing willow of alpine regions, characterized by many stolons.

S. NIPHOCLADA Rydb. Frequent along the Richardson Highway on the banks of glacial streams. Paxson, no. 121; Rapids, no. 1039; Fairbanks, no. 1084; Wiseman, no. 904.

These specimens seem to belong to the general complex of *S. brachycarpa* Nutt. and *S. niphoclada* Rydb. The leaves tend to become gray or spotted when dry, are rounded at the base, on short petioles.

S. GLAUCA L. A circumpolar willow which varies widely. The Alaskan-Yukon Valley representative was named *S. Seemanii* by Rydberg. Miller House, nos. 123, 733.

S. GLAUCA L., var. ACUTIFOLIA Schn. See Bot. Gaz. **66**: 327 (1918), and **67**: 60 (1919); RHODORA **33**: 241–4 (1931). Very common along streams. Paxson, no. 124; Rapids, no. 1038; Circle Springs, no. 125; Miller House, no. 126; Ft. Yukon, no. 128; Wiseman, no. 899.

S. BARCLAYI Anders. Paxson, no. 129.

S. ALAXENSIS (Anders.) Cov., var. LONGISTYLIS (Rydb.) Schn. The felt-leaf willow is a characteristic common tree of valleys of the Interior. Park, no. 597; Miller House, nos. 130, 732; Wiseman, no. 901.

S. BEBBIANA Sarg. *S. rostrata* Richards. A shrub or small tree common in woods and along the banks of creeks and sloughs. Park, no. 593; Circle Springs, no. 131; Fairbanks, no. 1083.

S. ARBUSCULOIDES Anders. Occasional. Park, no. 599; Miller House, no. 734.

S. PULCHRA Cham. Apparently rather rare in the Interior. Park, no. 598.

MYRICA GALE L. Rare in this region. Along the Yukon River, no. 133.

BETULA PAPYRIFERA Marsh. The common white birch of the Interior forests. Abundant and widespread. Miller House, no. 738; along the Yukon River, no. 134; Wiseman, no. 905.

B. GLANDULOSA Michx. A vast portion of the tundra is covered by this dwarf birch. Miller House, nos. 135, 739; Wiseman, no. 906.

B. GLANDULOSA Michx., var. SIBIRICA (Ledeb.) Blake. Park, no. 136; Wiseman, no. 907.

B. ERMANI × GLANDULOSA. Park, no. 601.

ALNUS CRISPA (Ait.) Pursh. *A. fruticosa* Rupr. Abundant along the edges of creeks and streams. Rapids, no. 1037; Wiseman, no. 908.

A. SINUATA Rydb. Along river banks, near Fort Yukon, no. 137.

GEOCAULON LIVIDUM (Richards.) Fernald in RHODORA **30**: 21–24 (1928). *Comandra livida* Richards. Common in sterile soil on hillsides, often associated with *Pedicularis labradorica*. Rapids, nos. 141, 1015; Circle Springs, no. 140; Wiseman, no. 909.

The leaves are frequently variegated.

RUMEX MEXICANUS Meisn. Along Yukon River, no. 142; Miller House, no. 740.

R. ARCTICUS Trautv. In bogs, Wiseman, no. 910.

R. ACETOSA L. On stony slopes, near Savage Camp, Park, no. 602.

OXYRIA DIGYNA (L.) Hill. Common in damp rocky crevices in the

mountains. Rapids, nos. 144, 1042; Park, no. 603; Eagle Summit, nos. 143, 741.

Polygonum aviculare L. Wiseman, no. 911.

P. viviparum L. Abundant throughout the alpine tundra. Park, no. 149; Eagle Summit, nos. 150, 744; Wiseman, no. 912.

P. Bistorta L. *P. plumosum* Small. Scattered over the tundra, this plant from Asia with plumy rose-pink spikes, occurs less frequently than the preceding circumpolar, bulb-bearing species. Park, no. 147; Miller House, no. 743; Eagle Summit, no. 148, 745.

P. alpinum All., var. lapathifolium Cham. & Schlecht. A tall, conspicuous plant, very common in thickets along roadsides and in gravelly places. Miller House, no. 746; Circle Springs, no. 151.

It is called "Wild Rhubarb," and, when young and tender, is sometimes used for greens.

P. hydropiperoides Michx. Circle Springs, no. 152.

P. Convolvulus L. Occasional. Fairbanks, no. 1074; Circle Springs, no. 153.

Chenopodium capitatum (L.) Asch. *Blitum capitatum* L. Common around cabins and in vacant lots. Fairbanks, nos. 154, 1076.

C. album L. A common weed. Fairbanks, no. 1077.

Claytonia sarmentosa C. A. Meyer. *Montia sarmentosa* Robinson. Large clumps of this delicate, pink *Claytonia* grew in wet, springy spots at the base of Eagle Summit, nos. 156, 747. A small specimen (in bloom) was brought to me by an Eskimo in Wiseman, no. 914.

C. tuberosa Pall. Occasional with the preceding at the base of the Summit, no. 748.

The large tubers of this white-flowered plant are eaten by Eskimos and Indians. Both these Claytonias have been considered endemic to the North Pacific or to the Bering Sea region.

C. Scammaniana Hultén in Botaniska Notiser **4**: 826–827, fig. 1 (1939). Porcupine Dome, July 12, 1937, no. 749.

A few plants of this brilliant purplish-magenta Claytonia made a vivid patch of color at the base of a melting snowbank on the lower slopes of the Dome. I saw it only in this one spot throughout the region. It is very characteristic in appearance, low in growth, single-flowered, with long, narrow basal leaves.

Stellaria calycantha (Ledeb.) Bong., var. isophylla Fernald. Not common. Miller House, no. 750-A.

S. calycantha (Ledeb.) Bong., var. floribunda Fernald. Miller House, no. 752.

S. crassifolia Ehrh. *Alsine crassifolia* (Ehrh.) Britton. Occasional in sloughs. Fairbanks, no. 862.

S. LONGIPES Goldie. *Alsine longipes* (Goldie) Cov. Common throughout the region. Very variable. Park, no. 611; Eagle Summit, no. 750; Circle Springs, no. 159. A glaucous form with stiffer leaves described as var. LAETA (Richards.) Wats. Rapids, nos. 160, 1008; Miller House, no. 751.

S. LONGIFOLIA Muhl. *Alsine longifolia* (Muhl.) Britton. Miller House, no. 752-a.

S. MEDIA (L.) Cyrill. Introduced. Fairbanks, no. 158; Wiseman, no. 920.

CERASTIUM VISCOSUM L. Introduced. Wiseman, no. 919.

C. BEERINGIANUM Cham. & Schlecht. Very common throughout the region. Park, no. 607; Fairbanks, no. 1055; Miller House, no. 753; Eagle Summit, no. 163.

C. BEERINGIANUM Cham. & Schlecht., var. GRANDIFLORUM (Fenzl) Hult. Fl. Aleut. Isl. 165 (1937). This larger variety, with petals much longer than the green sepals and acute leaves, is not as common. In wet places. Rapids, nos. 162, 1009; Eagle Camp, no. 698.

SPERGULARIA RUBRA (L.) J. & C. Presl. Probably introduced. Fairbanks, no. 1067.

ARENARIA LATERIFLORA L. *Moehringia lateriflora* (L.) Fenzl. Not very common, but widely distributed in woods and thickets. Curry, no. 571; Miller House, no. 760; Circle Springs, no. 164.

A. PHYSODES DC. *Merckia physodes* Fisch. This North Pacific species seems to be very plentiful wherever it is found in this region. In gravel and mining debris at Miller House, no. 755; Circle Springs, no. 166; Wiseman, no. 915.

A. DAWSONENSIS Britton. Rare. Along road at the base of Eagle Summit, no. 167; Wiseman, no. 918.

A. RUBELLA (Wahlenb.) Sm. On stony ground. Park, no. 610; Rapids, nos. 169, 1007.

A. ROSSII R. Br. On damp slopes. Conspicuous for its reddish-purple sepals. Miller House, no. 168; Eagle Summit, no. 756.

A. OBTUSILOBA (Rydb.) Fernald in RHODORA **21**: 12–15 (1919). Park, no. 609; Rapids, no. 170; in great clumps on dry cliffs and ledges back of Miller House, no. 759.

A. ARCTICA Steven. *Minuartia arctica* (Steven) Aschers. & Graebn. Park, no. 173; Eagle Summit, nos. 174, 758.

A. MACROCARPA Pursh. *Minuartia macrocarpa* (Pursh) Ostenf. Park, no. 171; Eagle Camp, no. 697; Eagle Summit, nos. 172, 757.

Both this species and the preceding were very abundant on the mountains in the Park and the Eagle Summit region. They are sometimes confused, if not found in fruit. See Hultén, Fl. Kamtch. **2**: 79–81 (1928) for descriptions of the two species. The stems of *A. macrocarpa* are matted-cespitose instead of tufted; the lower leaves are denticulate and falcate; the stem-leaves are connate-clasping and

very glandular; the sepals and petals are longer than and of different shape from those of *A. arctica;* the flat filaments widen more gradually to the dilated base.

Silene acaulis L., var. exscapa (All.) DC. This arctic species forms large cushions in the mountains of the Interior. Abundant in gravelly places along the Savage River. Park, no. 605; Eagle Summit, nos. 175, 761.

S. acaulis L., var. subacaulescens (F. N. Williams) Fern. & St. John in Rhodora **23**: 119–120 (1921). This western cordilleran variety is rare in the Interior of Alaska. It was found only in the Park, nos. 176, 606.

S. repens Patrin. Occasional on exposed slopes at altitudes of about 2000 feet in places where one finds *Pedicularis labradorica, Arnica attenuata* and often *Dryopteris fragrans.* Miller House, nos. 177, 762; on road between Miller House and Eagle Summit, no. 178.

S. Williamsii Britt. in Bull. N. Y. Bot. Gard. **2**: 168 (1901); see Porsild in Rhodora **40**: 212 (1938). In dry places on the banks of the Chena River, Fairbanks, nos. 179, 1056.

Lychnis Tayloriae Robinson in Proc. Amer. Acad. **28**: 150 (1893). See Rhodora **34**: 22–25 (1932). Occasional in alpine regions. Eagle Camp, nos. 699, 764.

L. apetala L. *Melandrium apetalum* (L.) Fenzl. Seen only at the base of the higher summits. Eagle Summit, no. 180; Porcupine Dome, no. 763.

Nuphar variegatum Engelm. *Nymphozanthus variegatus* (Engelm.) Fernald. Observed commonly in ponds and small lakes in the lower regions of the Interior.

Caltha natans Pall. This small white-flowered *Caltha* is probably rare in the Interior. Collected only once in a wet, boggy area with *Ranunculus Purshii,* subsp. *yukonensis,* Circle Springs, no. 181.

It has an interesting distribution from northern Mongolia and Kamtchatka, in the Bering Sea region, with isolated stations in Alberta, Athabasca, and northern Minnesota.

C. palustris L., var. asarifolia (DC.) Huth. Very common in southwestern Alaska and observed in ditches along the R. R. tracks from McKinley Park to Fairbanks. Collected it at Seward, but neglected to get specimens from the Interior. Probably common in the lowlands.

Actaea rubra (Ait.) Willd. *A. spicata* L., var. *rubra* Ait. Apparently very rare in the central and northern Interior. Circle Springs, no. 183. Plants with white berries (forma neglecta (Gillman) Robinson—*A. cburnea* Rydb.) as well as red grew tall and luxuriantly in thickets and thin woods in the neighborhood of the Hot Springs. Both specimens in fruit. Circle Springs, no. 184.

Delphinium Menziesii DC. Frequent in the mountains of the Interior. Eagle Summit, nos. 186, 765; on the way to Porcupine Dome, no. 766.

D. scopulorum Gray, var. glaucum Gray. *D. Brownii* Rydb. A tall plant often four or five feet high. Collected in two places only, but it appeared to be common in thin woods in lower regions. Rapids, no. 1014; Fairbanks, no. 185.

Aconitum delphinifolium DC. Widespread and common throughout the Interior, in thickets on hills and slopes of mountains. Rapids, nos. 188, 1013; Circle Springs, no. 187; Eagle Summit, no. 771; Wiseman, no. 922.

Anemone patens L., var. Wolfgangiana (Bess.) Koch. *Pulsatilla ludoviciana* (Nutt.) Heller. My specimen from the Park, no. 613, was in fruit, but a beautifully pressed flower was given me by a young girl in Fairbanks.

A well-known and beloved wild flower of the Interior, called generally "Wild Crocus." The very large purple blossom comes very early in the spring as soon as the snow melts.

A. parviflora Michx. One of the earliest flowers to bloom at Savage River Camp, in the Park, about the middle of June, no. 616. In Wiseman, no. 923, I collected both flowers and fruit the first week in August. Other collections were made at Rapids, no. 191, and on the road below Eagle Summit, no. 190.

A very common *Anemone* of wide-spread distribution. The backs of the sepals are usually tinged pink or blue.

A. parviflora, var. grandiflora Ulbr. in Engl. Bot. Jahrb. **37**: 251 (1905). Park, nos. 189, 617.

This variety, with the large flowers nearly two inches in diameter, was the most abundant at Savage River Camp. It seemed quite distinct, the sepals in my specimens lacking the bluish tinge.

A. multifida Poir., var. hudsoniana DC. *A. globosa* Nutt. See Rhodora **19**: 141 (1917). Occasional in gravelly places. Rapids, no. 192.

A. narcissiflora L. *A. zephyra* A. Nels. One of the most beautiful of the Alaskan wild flowers, growing sometimes in large masses, in dry, rocky soil in the mountains of the Interior. General throughout the territory. Park, nos. 614, 615; Eagle Summit, nos. 195, 767. Often the plants of higher altitudes where there is little soil are single-flowered, described by Eastwood as var. uniflora.

A. Richardsonii Hook. This low-growing bright yellow Anemone prefers moist, springy ground. Common along the southwestern coast, and also in the Bering Sea region, but occasional in the Yukon Valley. Park, no. 612.

Ranunculus Purshii Richards., ssp. yukonensis (Britt.) Porsild. *R. yukonensis* Britt. in Bull. N. Y. Bot. Gard. **2**: 168 (1901). Occasional along edges of ponds. On the mud of a dried-out swamp. Both flowers and leaves very small. Circle Springs, no. 198.

R. hyperboreus Rottb. In wet places. Paxson, no. 199.

R. nivalis L. Park, no. 618; Eagle Summit, nos. 200, 769.

True to its name this bright yellow buttercup is found often abundantly just below melting ice or snow patches in the mountains. A characteristic field mark is the brown- or black-hairy calyx.

R. pygmaeus Wahlenb. A small arctic-alpine plant, very rare in the mountains of the central Interior. Seen only on Eagle Summit, nos. 201, 770.

R. sceleratus L. In ditches near Ester Creek, Fairbanks, no. 202.

Thalictrum sparsiflorum Turcz. In ditches along wooden sidewalks in Fairbanks, no. 210.

Papaver alaskanum Hultén, Fl. Aleut. Isl. 190, tab. 10 (1937). Park, no. 619.

In bloom the middle of June on a sunny exposed spot where the snow had just melted. These were low-growing plants with many old petioles, deeply dissected grayish-green leaves, well covered with stiff hairs, and pale yellow flowers with the central projection of the stigma absent.

P. microcarpum DC. A tall, slender, large-flowered, deep yellow poppy, frequent in the hills. Eagle Summit, no. 772; Wiseman, no. 968.

One plant only, very unusual and distinctive, with white petals, bordered by a wide pink band, and with dark green leaves, was collected at Eagle Summit, no. 212.

Corydalis pauciflora (Steph.) Pers. A low plant with several large pinkish-lavender spurred flowers, apparently common in the alpine meadows of the Park, no. 620, but rather rare elsewhere in the Interior. It grew also at Eagle Summit (field notes).

C. sempervirens (L.) Pers. Apparently rare. On a rocky slope behind the R. R. station. Park, no. 213.

Eutrema Edwardsii R. Br. Collected only near top of Eagle Summit, no. 774.

This circumpolar, arctic species, known usually from the northern coast and the Bering Sea region is rare in the higher mountains of the Interior. See Fernald in Mem. Gray Herb. **2**: 337 (1925), for map of general distribution.

Brassica campestris L. Introduced. Miller House, no. 218.

Rorippa barbareaefolia (DC.) Kitagawa in Journ. Jap. Bot. **13**: 137 (1937). In damp places near the mines. Miller House, no. 777.

R. curvisiliqua (Hook.) Bess. Occasional. Park, no. 223; Rapids, no. 224.

Barbarea ? planisiliqua C. A. Meyer. Not well developed. Curry, no. 569.

Cardamine pratensis L. Not common in the Interior. In damp thicket beside the Savage River, Park, no. 629; Wiseman, no. 1188.

C. pratensis, var. angustifolia Hook. Park, no. 628.

C. purpurea Cham. & Schlecht. This beautiful little arctic plant of Siberia and Alaska grows in masses in moist alpine situations in the mountains of the Interior. Park, no. 627, (white-flowered form) no. 626; Eagle Summit, nos. 226, 779.

C. bellidifolia L. Rare in the mountains. Eagle Summit, nos. 227, 780.

C. bellidifolia L., var. beringensis A. E. Porsild in Trans. Royal Soc. of Can. ser. 3, sect. 5, **32**: 31 (1938). This sturdy, vigorous variety with broader and shorter siliques was collected in damp ground on lower slopes of Eagle Summit, no. 781 (listed by Porsild in Rhodora **41**: 234 (1939).

All previous collections are from the islands and nearby shores of Bering Sea. New to the Interior of Alaska.

Lesquerella arctica (Wormskj.) Wats., var. Scammanae Rollins in Am. Journ. Bot. **26**: 421 (1939). A new variety of *L. arctica*, taller in growth, with long slender pedicels and leaves, grew abundantly on a dry, gravelly bank near Gunnysack Creek. It was collected both years in the same place, but not seen elsewhere. *L. arctica* is rare in Alaska, as, with the exception of specimens from the Bering Sea region, it has been reported only from the head of the Chitina River. The type of the new variety is no. 216, Rapids, Aug. 7–10, 1936. The second collection, Rapids, no. 1000.

Thlaspi arvense L. In waste grounds around roadhouses and cabins. Introduced. Rapids, nos. 217, 1002; Fairbanks, no. 863.

Lepidium apetalum Willd. Fairbanks, no. 864.

Neslia paniculata (L.) Desv. Introduced. Fairbanks, no. 1069.

Capsella Bursa-pastoris (L.) Medic. Observed in several places about settlements, but failed to collect it.

Draba alpina L. Seen only once. Park, no. 625. Rare.

Dr. nivalis Lilj. Delicate, tufted, in dry gravels near Savage River. Park, no. 621.

Dr. praealta Greene. A Rocky Mountain species. Park, nos. 214-B and 622.

Dr. glabella Pursh. See Fernald in Rhodora **36**: 333 (1934). Common in alpine situations in Interior. Park, no. 214-A; Rapids, no. 215.

Dr. borealis DC. An Asiatic-Northern Pacific species. Park, no. 623-A.

Descurainia sophioides (Fisch.) O. E. Schulz in Engler, Pflanzenr. **4**: 105: 316 (1924). Common and abundant in settlements and mining districts. Park, no. 632; Miller House, no. 776; Wiseman, no. 926.

Arabis lyrata L., var. kamchatica Fisch. Very common at Seward and along the coast where it was one of the first plants to bloom in the spring, but not seen as often in the Interior. Rapids, nos. 229, 1001.

A. lyrata L., var. glabra (DC.) Hopkins in Rhodora **39**: 93–94 (1937). In dry stony places. Park, no. 630; Rapids, no. 228.

A. divaricarpa A. Nelson. Probably rare in Alaska in dry sandy places. Along R. R. track from Anchorage to Curry, no. 568; Park, no. 633.

Erysimum cheiranthoides L. Very common and of widespread distribution in the central Interior. Probably introduced. Fairbanks, no. 221; Miller House, no. 775; Circle Springs, no. 220; along Yukon River, no. 222; Wiseman, no. 925.

Parrya nudicaulis (L.) Regel. *P. macrocarpa* R. Br. In open woods in the Park, no. 631; Eagle Summit, nos. 225, 778.

A showy plant with large flowers varying from white and pink to lavender and purple. It is popularly called "Wild Stock" in Alaska and is fairly common in Alpine regions in moist tundra. There is considerable variation in the leaves and in the degree of glandular pubescence.

Sedum roseum (L.) Scop., var. integrifolium (Raf.) Hultén, Fl. Aleut. Isl. 205 (1937). *Rhodiola integrifolia* Raf. See also Porsild in Rhodora **41**: 239–240 (1939). Common throughout the Territory in moist mossy crevices. Park, no. 230; Circle Springs, no. 231. Also seen at Eagle Summit, no. 783.

Boykinia Richardsonii (Hook.) Gray. This tall conspicuous plant is seen occasionally in damp open ground in subalpine regions. Park, no. 233; Wiseman (in fruit), no. 928.

Saxifraga rivularis L. In wet mossy crevices in the mountains. Rapids, no. 235 (in fruit); Eagle Summit, nos. 234-A, 784.

S. adscendens L. One specimen resembles closely this cordilleran species. Very rare in Alaska. Eagle Summit, no. 234-B.

S. foliolosa R. Br. *S. stellaris* L., var. *comosa* Retz. Most of the flowers on the delicate stem are replaced by tiny tufts of green leaves. In wet ground beside a small ditch. Eagle Summit, no. 791.

Probably new to the flora of the Interior.

S. hieracifolia Waldst. & Kit. Occasional in alpine tundra. Park, no. 638; Circle Springs, no. 236; Eagle Summit, no. 785.

S. reflexa Hook. Fl. Bor.-Am. **1**: 249, tab. 85 (1840). *S. yukonensis* Small. On a gravelly bank, Park, no. 637.

Apparently rare, as it has been recorded in two other stations only in the Interior.

S. PUNCTATA L. sens. lat. Common on moist ledges in the Eagle Summit region, nos. 237, 238, 786; almost at the very top of Porcupine Dome, no. 787.

This group is very variable. See Hultén, Fl. Aleut. Isl. 213–214 (1937) and Sv. Bot. Tidskr. 30, 3: 324, fig. 5 (1936). Most of my specimens have the inflorescence more open, dark purple capsules and purplish-tinged leaves and scape, as in ssp. *insularis* Hultén.

S. TRICUSPIDATA Rottb. Common on dry ledges in all the subalpine regions where I collected. Sometimes forming large mats over rocks, and readily separated from the next species by the rigid leaves with three sharp teeth. Park, nos. 239, 636; Rapids, no. 1003; Miller House, no. 788; Wiseman, no. 929.

S. BRONCHIALIS L. ssp. FUNSTONII (Small) Hult. Fl. Kamtch. **3**: 12–17 (1929). Fairly common also in stony places. Park, no. 636-A; Eagle Summit, nos. 240, 789; Wiseman, no. 930.

S. ESCHSCHOLTZII Sternb. Rapids, no. 1041.

This dwarf cespitose *Saxifraga* of Asiatic-Western American distribution is rarely found. Probably the second record for the Interior.

S. FLAGELLARIS Willd. Occasional in the mountains of the Interior. In a swampy meadow in Park, nos. 241, 635; Wiseman, no. 931.

The specimens in the two collections differ considerably. No. 931 has a much larger single flower with very long flagella.

S. HIRCULUS L. Park, no. 242; Eagle Summit, nos. 243, 790.

A common and beautiful Saxifrage, with large bright yellow flowers, the petals usually red-spotted, growing in wet boggy places in the mountains.

S. OPPOSITIFOLIA L. This well-known circumpolar species seemed to be surprisingly rare in the central Interior. Park, no. 634.

PARNASSIA PALUSTRIS L., var. NEOGAEA Fernald in RHODORA **39**: 310–312 (1937). Common and abundant throughout the region, except in the higher altitudes. Park, no. 247; Rapids, no. 1004; Big Delta, no. 250; Fairbanks, no. 1070 (a freak form); Miller House, no. 793; Circle Springs, no. 249; Wiseman, nos. 248, 932.

Prof. Fernald has described in detail, with plates, the differences between the American plant and the head form. Several of my specimens, especially those from Wiseman, seem to show transitional forms between the variety and the typical form of the species.

P. KOTZEBUEI Cham. & Schlecht. Found often in damp thickets in sub-alpine regions. Miller House, no. 792; Eagle Mining Camp, no. 695; Circle Springs, no. 251; Wiseman, no. 1189.

RIBES TRISTE Pall. Occasional. Wiseman, no. 927.

Spiraea Beauverdiana Schneid. See Hultén, Fl. Kamtch. **3**: 38–41 (1929). *S. betulifolia* Am. auth., non Pall.; *S. Stevenii* (Schneid.) Rydb. Very common along roadsides, in thickets, and dry tundra throughout. Miller House, no. 794; Circle Springs, no. 253; Wiseman, no. 933.

Rubus idaeus L., var. canadensis Richardson. A delicious wild raspberry common in thickets of the Interior. Miller House, no. 796; Circle Springs, no. 254.

R. Chamaemorus L. The Cloudberry or Baked-apple Berry is abundant in moist tundra and peat bogs throughout. Park, no. 640; Miller House, no. 795; Circle Springs, no. 255; Wiseman, no. 934.

R. acaulis Michx. In moist ground near Savage River. Park, no. 639.

R. arcticus L. Wiseman, nos. 935, 935-A.

The specimens from Wiseman seem to belong here, although *R. arcticus* and *R. acaulis* are confusing and critical in Alaska. Stems leafy, calyx-lobes densely pubescent, petals obovate and less clawed.

Fragaria yukonensis Rydb. A small-fruited strawberry with long runners, common on banks of sloughs. Fairbanks, no. 1072.

Potentilla norvegica L. Common in low ground. Miller House, no. 798; Fairbanks, no. 260; Wiseman, no. 937.

P. nivea L. See Hultén, Fl. Kamtch. **3**: 68–69 (1929) for discussion of this and *P. uniflora*. Occasional. Park, no. 642; Rapids, no. 261.

P. uniflora Ledeb. On bare rocky places in the mountains. Not common. Park, no. 641; Wiseman, no. 936.

P. pensylvanica L. Sandy banks of rivers. Rapids, nos. 262, 1010; Eagle on the Yukon, no. 263.

P. Nuttallii Lehm. Eagle, no. 264; Along Yukon River, no. 265.

P. gracilis Dougl. New to interior of Alaska. Wiseman, no. 938.

P. biflora Willd. On the slopes of Porcupine Dome, no. 800.

A tufted alpine Potentilla, very characteristic, with thick woody caudex, leaves with linear divisions, calyx-lobes and bractlets of a reddish tinge, as is also the stem, and pale yellow petals. According to Wolf it has a wide range from the Himalayas and mountains of Central Asia to arctic regions of eastern Asia and Western N. A., but is nowhere common. It has been collected at Cape Thompson, and several places on the Seward Peninsula, but this, a far inland station, is the first record for the Interior.

P. elegans Cham. & Schlecht. in Linnaea **2**: 22 (1827); Ledeb. Fl. Ross. **2**: 56; Lehmann, Rev. Potentill. 53, fig. 1 (1856); Wolf, Monogr. Gatt. Potentilla, 532 (1908). Amid rock fragments on the bare, wind-swept top of Porcupine Dome, no. 801 (flowers and fruit). The first record for Interior Alaska, and the second for the North American continent.

The finding of this dainty, low, tufted Asiatic Potentilla, with caudex crowded with persisting brown stipules, three-foliolate leaves, hairy calyx, and pale yellow petals, a little longer than the sepals, was a happy experience of the summer. At home in the mountains of Siberia and north-western Mongolia, it was collected once before by Thornton, in the Sawtooth Range on Seward Peninsula, and reported by Porsild, RHODORA **41**: 246 (1939). Its closest relative is *P. Robbinsiana* Oakes, a rare endemic of the White Mountains, N. H.

P. EGEDII Wormsk., var. GROENLANDICA (Tratt.) Polunin in RHODORA **41**: 40 (1939). *P. pacifica* Howell. Very common along the Yukon River, nos. 270, 271 (very silvery hairy); Rampart, no. 269.

P. PALUSTRIS (L.) Scop. *Comarum palustre* L. In wet places, Paxson, no. 267.

P. FRUTICOSA L. This shrubby Potentilla, known in the Interior as "Tundra Rose," is one of the most abundant and characteristic plants in the region. In lowlands, beside roads, in dry tundra, and in subalpine locations. Fairbanks, no. 1071; Miller House, no. 799; Wiseman, no. 268. Also common in Park (field notes).

GEUM MACROPHYLLUM Willd., var. PERINCISUM (Rydb.) Raup in RHODORA **33**: 172–176 (1931). Common around settlements. Fairbanks, no. 275; Circle Springs, no. 274.

G. ROSSII (R. Br.) Sér. *Sieversia Rossii* R. Br. A beautiful plant, abundant in wet, springy ground, in the higher mountains; often below snow patches. Eastern Asiatic-Western American. Park, no. 643; Eagle Summit, no. 802-A; slopes of Porcupine Dome, no. 802.

SANGUISORBA OFFICINALIS L. *S. microcephala* Presl, according to Rydb. in N. Am. Fl. **22**^{4}: 387 (1908). Along the banks of rivers. Tanana, no. 285.

Both Hultén and Porsild think the American plant should not be separated.

S. SITCHENSIS C. A. Meyer. Not seen north of the Alaska Range. Beside a brook in the woods above Rapids, nos. 284, 1011.

S. ? MENZIESII Rydb. Form with oblong spikes and purple calyx. In same places as above. Rapids, nos. 286 and 1011-A.

DRYAS DRUMMONDII Richards. Occasional in gravel bars along rivers. Park, no. 277. Abundant in large mats along the paths of the village, mostly with the striking feathery akenes, as it was in August, but several with the low-stemmed nodding yellow flowers. Wiseman, nos. 278, 941.

DR. OCTOPETALA L. Very common in dry, stony places in the mountains. Growing so closely in thick mats that the ground looks as though covered by snow patches. Park, no. 645; Rapids, nos. 282, 1012; Eagle Summit, nos. 281, 803.

DR. INTEGRIFOLIA M. Vahl. Not as frequent as the preceding species. In gravels in the mountains. Park, nos. 279, 644.

Dr. integrifolia M. Vahl, var. sylvatica Hultén in Sv. Bot. Tidskr. **30**, 3: 527, fig. 2a (1936). Below Ft. Yukon on wooded bank, no. 280; Wiseman, in woods, no. 940.

Rosa acicularis Lindl. Very common everywhere except in the high mountains. Fairbanks, nos. 287, 1057; along Yukon River, no. 288; Wiseman, no. 942. Also at Miller House, but did not collect it there.

The beautiful wild rose of Alaska, with very prickly stems, pyriform fruit, and large fragrant flowers.

Trifolium pratense L. Introduced. Fairbanks, no. 1079.

T. hybridum L. Introduced. Fairbanks, no. 1078.

Medicago lupulina L. Miller House, no. 811.

Lupinus arcticus Wats. Common on dry sandy slopes throughout the region. In open woods in the Park, nos. 289, 646; Circle Springs, no. 290.

Astragalus frigidus (L.) Gray, var. littoralis (Hook.) Wats. Occasional in subalpine locations. Park, no. 649; Miller House, nos. 293, 804.

A. alpinus L. Generally common. Park, no. 648; Rapids, no. 292; Fairbanks, no. 690; Wiseman, no. 943.

A. yukonis Jones, Revision of N. A. Astragalus, p. 89 (1923). Tanana, along the Yukon River, no. 294. Possibly the first record for Alaska.

This weak-stemmed, much branched *Astragalus*, with flowers capitate in bloom and pods ascending, is very rare in herbaria. It was described from specimens found by Gorman near Ft. Selkirk, Yukon Territory. Later collected by Eastwood at Whitehorse, and recently by Raup on the Athabaska.

A. falciferus Hult. *Gynophoraria falcata* Rydb. See Hultén in Sv. Bot. Tidskr. **30**, 3: 526. Rare. On rock pile near Sable Pass, Park, no. 647.

Second report for Alaska.

Oxytropis Maydelliana Trautv. *O. campestris* DC., var. *melanocephala* Hook. Rare in the high mountains of the Interior. Eagle Summit, no. 805; on way down from Porcupine Dome, no. 805-A.

Characterized by chestnut-colored stipules.

O. Mertensiana Turcz. Porcupine Dome, no. 809.

A distinctive eastern Asiatic species, very rare in the Interior, probably the first station, but reported previously twice from Seward Peninsula. The third record for Alaska.

O. arctica R. Br. Eagle Summit, no. 806; Porcupine Dome, no. 807.

O. PYGMAEA (Pall.) Fernald in RHODORA **30**: 153 (1928). Occasional in the mountains. Park, no. 650; Eagle Summit, no. 808.

O. HUDSONICA (Greene) Fernald. Near Polychrome Pass, Park, no. 651.

A plant with a strong tap-root, leaflets 18 or more, usually attenuate, and very glandular calyx.

O. GRACILIS (A. Nels.) K. Schum. Fairly common. Park, no. 295; Rapids, no. 296; Wiseman (in fruit), no. 945.

O. DEFLEXA (Pall.) DC. Wiseman, no. 944.

This specimen has truncate calyx-tubes, with broad, rectangular sinuses between short teeth. It is, therefore, the true Siberian *O. deflexa*, not *O. retrorsa* Fernald, the American plant which formerly passed in America as *O. deflexa*. See RHODORA **30**: 140 (1928). *O. retrorsa* has lanceolate, approximate calyx-lobes and acute sinuses. Second record for Alaska.

HEDYSARUM ALPINUM L., var. AMERICANUM Michx. A variable species, very common along sloughs and creeks throughout the Interior. Park, nos. 304, 653; Rapids, nos. 302, 1018; Fairbanks, nos. 301, 689; Miller House, no. 810; Circle Springs, no. 300; along Yukon River, no. 303; Wiseman, no. 947.

H. MACKENZII Richards. Occasional in thickets along rivers and streams. Rapids, no. 1017; Wiseman, nos. 306, 946.

GERANIUM ERIANTHUM DC. Not seen north of the Alaska Range. Curry, no. 566.

LINUM LEWISII Pursh. Fairbanks, no. 865.

EMPETRUM NIGRUM L. The Crowberry is abundant in heaths and bogs, especially in subalpine regions. Park, no. 308; Rapids, no. 1022; Miller House, no. 812; Circle Springs, no. 309; Wiseman, nos. 310, 948.

VIOLA BIFLORA L. The Violas are among the rarest plants of the Interior. This yellow-flowered species was collected but once, in a willow thicket on a slope back of the ranger cabin at Igloo, Park, no. 654.

V. ? PALUSTRIS L. In swamps, Circle Springs, no. 312; Fox near Fairbanks, no. 313.

Not sufficient material to be sure of this. Collected *V. epipsila* Ledeb. in Seward on the southwestern coast, but did not see it in the Interior.

SHEPHERDIA CANADENSIS (L.) Nutt. The "Soap berry" is common in open woods and thickets along streams. Park (in bloom), no. 655; Fairbanks, no. 315; Circle Springs, no. 314; Wiseman, no. 949.

CIRCAEA ALPINA L. Circle Hot Springs, no. 327.

Apparently the second record from the Interior. Porsild reports it from Tanana Hot Springs, in RHODORA **41**: 263 (1939).

Epilobium angustifolium L. *Chamaenerion angustifolium* (L.) Scop. The Fire-weed is, doubtless, the most spectacular plant in Alaska, covering entire hills and meadows with a rose-magenta blanket. It also fringes both the Richardson and Steese Highways. Paxson, no. 316; Fairbanks, no. 1060; Wiseman, no. 950.

E. angustifolium, forma albiflorum (Dumort.) Haussk. Occasional. Wiseman, no. 318.

E. angustifolium, forma spectabile (Simmons) Fern. Miller House, no. 813.

E. latifolium L. *Chamaenerion latifolium* (L.) Sweet. The large-flowered "River Beauty," as it is sometimes called in Alaska, is often found on gravel bars in rivers and creeks in subalpine regions. For map of general distribution see Fernald in Mem. Gray Herb. **2**: 337 (1925). Park, no. 320; Miller House, no. 814; Wiseman, nos. 321, 951, (a pale pink form) no. 952.

E. latifolium L., var. kamtschaticum Haussk. Park, no. 323; Wiseman, no. 953.

E. palustre L. In wet ground by a creek. Miller House, no. 815.

E. glandulosum Lehm. A northern station for this species. Circle Hot Springs, no. 324.

Bupleurum americanum Coult. & Rose. Common in dry gravels. Park, no. 329; along Yukon River, no. 330; Wiseman, no. 954.

Conioselinum cnidiifolium (Turcz.) Porsild in Rhodora **41**: 267–268 (1939). *C. dawsoni* Coult. & Rose. On the bank of the Chena Slough, Fairbanks, no. 1081; along Yukon River, no. 333.

Heracleum lanatum Michx. This very tall, large plant grew in a woody thicket back of Gunnysack Creek, Rapids, no. 332.

Did not see it farther north.

Cornus canadensis L. Common in wooded areas, also in damp open places. Rapids, no. 1021; Fairbanks, nos. 337 and 691; Miller House, no. 335; Circle Springs, no. 334.

C. canadensis L., var. intermedia Farr. *C. unalaschkensis* Ledeb.; *C. canadensis* × *suecica* Hult. Fl. Aleut. 253–254 (1937). See also Porsild in Rhodora, **41**: 270 (1939). Occasional. Park, no. 656; near Donnelly Dome on Richardson Highway, no. 339; Circle Springs, no. 338.

C. stolonifera Michx., var. Baileyi (Coulter & Evans) Drescher. A common shrub in the Yukon Valley and central interior region. Fairbanks, no. 342; Circle Springs, no. 341.

Moneses uniflora (L.) Gray. In moist woods. Park, no. 344.

M. uniflora, var. reticulata (Nutt.) Blake. Rapids, nos. 345, 1020.

Pyrola secunda L. A wooded ravine, Wiseman, no. 956.

P. secunda L., var. obtusata Turcz. Rich woods, Rapids, no. 1019; Paxson, no. 349; Circle Springs, no. 348.

P. grandiflora Radius. Circle Springs, no. 351.

P. GRANDIFLORA, var. CANADENSIS (Andres) A. E. Porsild. Wiseman, no. 955-B.

P. GRANDIFLORA, var. GORMANII (Rydb.) A. E. Porsild. Common in open spruce woods near Savage River, Park, no. 657; Eagle Summit, no. 817. See Porsild, RHODORA, **41**: 271–273 (1939), for discussion of this species and varieties.

P. ASARIFOLIA Michx., var. INCARNATA (DC.) Fern. in RHODORA **6**: 178 (1904). Wiseman, no. 955–A.

LEDUM GROENLANDICUM Oeder. The Labrador Tea is very common in muskegs in the central Interior. Fairbanks, no. 355; Circle Springs, no. 354; Wiseman, no. 957.

L. PALUSTRE L., var. DECUMBENS Ait. *L. decumbens* (Ait.) Small. A dwarf, more northern species, with narrowly linear leaves, growing in the mountains. Park, no. 658; Eagle Summit, nos. 356, 820.

RHODODENDRON LAPPONICUM (L.) Wahlenb. Occasional on alpine slopes and also on the banks of the Savage River in the Park, no. 664.

LOISELEURIA PROCUMBENS (L.) Desv. The little "Alpine Azalea" is found occasionally on bare mountain slopes. Park, no. 659; Eagle Summit, no. 818; Circle Springs, no. 357.

CASSIOPE TETRAGONA (L.) D. Don. Very common and widespread on mossy ledges and alpine summits. Park, nos. 361, 660; Eagle Summit, no. 362; Wiseman, no. 958.

ANDROMEDA POLIFOLIA L. Common in peat bogs and tundra throughout. Fairbanks, no. 363; Eagle Summit, no. 819; Wiseman, no. 959.

CHAMAEDAPHNE CALYCULATA (L.) Moench. In low bogs. Fairbanks, no. 365; Circle Springs, no. 364; Wiseman, no. 960.

ARCTOSTAPHYLOS UVA-URSI (L.) Spreng. Bearberry or Kinnikinick is found now and then on dry bare slopes. Park, no. 661; Circle Springs, no. 366; Wiseman, no. 961.

A. RUBRA (Rehder & Wilson) Fernald. *A. alpina* (red-fruited form) of Richards. Very common in this region. Circle Springs, no. 367; Wiseman, no. 962.

The thin, deciduous leaves turn scarlet in the fall, causing the hills and lower mountain slopes of central Alaska to become masses of brilliant color.

VACCINIUM ULIGINOSUM L. The highly-prized blueberry of the Interior. Common in heaths and tundra. Fairbanks, no. 368; Wiseman, no. 963.

V. ULIGINOSUM L., var. ALPINUM Bigel. In alpine situations. Park, no. 662; Wiseman, no. 963-a.

V. VITIS-IDAEA L., var. MINUS Lodd. Common on dry slopes. Park, no. 663 (in flower); Circle Springs, no. 369; Wiseman, no. 964 (in fruit).

DIAPENSIA OBOVATA (Fr. Schmidt) Nakai in Nakai and Koidzumi, Trees and Shrubs of Japan proper, 194 (1922). *D. lapponica* L., var.

obovata Fr. Schmidt. Rather rare on mountain ledges. Top of Polychrome Pass, in Park, no. 665; rocky cliff above the Lodge, Rapids, no. 371; Eagle Summit, no. 821.

See Porsild in Trans. Royal Soc. of Can., ser. 3, sect. 5, **32**: 35 (1938), for discussion of *D. obovata* and *D. lapponica*. *D. obovata*, loosely caespitose with trailing branches, and of a reddish-green tinge, with short, thick styles is of Eastern Asiatic-Western American distribution, and all records west of the Mackenzie should be referred to it according to Porsild.

Douglasia Gormanii Constance in Am. Midland Naturalist, **19**: 257 (1938). A tiny caespitose plant with several rose-purplish flowers was found on a bare summit near Polychrome Pass in the Park, on June 20th, no. 675.

This very rare little plant I put with some hesitation here. The backs of the leaves are pubescent with forked hairs and the margins not definitely ciliolate, which corresponds to Constance's description. But specimens of this and *D. arctica* Hook. are so rare in herbaria that it is difficult to make determinations without more material. *D. arctica*, a rare arctic plant of the region west of the Mackenzie, is known in Alaska only by a sheet from Bering Strait. The type of *D. Gormanii*, and one other collection mentioned by Constance, are from Yukon River Valley and Lake Kluane in Yukon Territory respectively, so this is the first record for Alaska.

Androsace Chamaejasme Host, var. arctica R. Knuth. ?*A. Lehmanniana* Spreng. Occasional in sandy places. Near Savage River Camp, Park, no. 667.

A. septentrionalis L. *A. Gormanii* Greene. Rare. Dry cliff back of R.R. station in Park, no. 687.

Dodecatheon frigidum Cham. & Schlecht. A beautiful western-arctic "Shooting Star," common in wet, springy ground in high alpine regions of the Interior. Park, nos. 372, 666; Eagle Summit, nos. 373, 822.

Trientalis europaea L., var. arctica (Fisch.) Ledeb. Along the wooded bank of the river at Curry, nos. 572, 573.

No. 573 has narrow, acute leaves instead of broad and obtuse, and lanceolate petals. Also seen in a willow thicket in Fairbanks.

Gentiana propinqua Richards. See Hooker, Fl. Bor.-Am. **2**: 62, tab. 150 (1840). Twelve Mile, on Steese Highway, no. 377; Wiseman, nos. 376, 965.

These two collections are true *G. propinqua*, tall, but delicate stems, purplish, many branched, with a slender corolla, 10–15 mm. long, and generally short, very unequal calyx-lobes.

Other collections—Park, no. 375; Rapids, no. 1024; Miller House, no. 379; Circle Springs, no. 378—show much stouter plants with stem and leaves yellowish-green, cauline leaves more connate-clasping and calyx-lobes longer and united in a tube. Although they are different from typical *G. propinqua*, they can not be satisfactorily placed in any other species.

G. PROSTRATA Haenke. This low-growing, often almost prostrate Gentian with small blue flowers is found only occasionally in damp ground in the mountains. Park, no. 380; Rapids, no. 381.

G. GLAUCA Pall. A rare alpine plant with corolla of a strange shade of greenish-blue, growing in moist places on high mountains. Park, no. 382; Eagle Summit, nos. 383, 823.

SWERTIA PERENNIS L., var. OBTUSA (Ledeb.) Griseb. Collected only once, in the Alaska Range, beside a brook at Paxson, no. 384.

LOMATAGONIUM ROTATUM (L.) Fries, forma TENUIFOLIUM (Griseb.) Fernald in RHODORA **21**: 197 (1919). *Pleurogyne rotata* (L.) Griseb. β. *tenuifolia* Griseb. Occasional in marshy ground in the Interior. Fairbanks, no. 385; Wiseman, no. 966.

POLEMONIUM ACUTIFLORUM Willd. Very common in damp meadows throughout the region. Park, no. 668; lower slope of Eagle Summit, nos. 386, 825; Tanana, no. 387.

P. PULCHERRIMUM Hook. Circle Springs, no. 388.

PLAGIOBOTHRYS CUSICKII (Greene) Johnston. Introduced, Fairbanks, no. 1080-a.

P. COGNATUS Johnston. Dry ground, Fairbanks, no. 1080.

AMSINCKIA MENZIESII (Lehm.) Nels. & Macbride. Probably introduced. Rapids, nos. 395, 1023.

ERITRICHIUM ARETIOIDES (Cham. & Schlecht.) DC. Eagle Summit, no. 826-A; Porcupine Dome, no. 826.

A charming little fuzzy plant of the high mountains, with a rosette of hairy leaves at the base, rising from a woody root covered with brown leaves; the flowers in a capitate head, blue with a yellow eye, and very fragrant.

MYOSOTIS ALPESTRIS Schmidt, ssp. ASIATICA Vestergr. Twelve Mile Summit on the Steese Highway, no. 392; Wiseman, no. 967.

The "Forget-me-not" is the Territorial flower, found in alpine meadows, and moist ledges of the mountains.

MERTENSIA PANICULATA (Ait.) G. Don. One of the most conspicuous and graceful plants of open woods, common throughout the Interior. Curry, no. 567; Park, no. 669; Paxson, no. 397; Miller House, no. 827; Eagle, on the Yukon, no. 399.

STACHYS SCOPULORUM Greene. *S. palustris* L., subsp. *pilosa* (Nutt.) Epling. Fairbanks, no. 866.

Scutellaria epilobiifolia Hamilton. See Fernald in Rhodora **23**: 86 (1921). Fairbanks, no. 401.

Mentha canadensis L., var. glabrata Benth. In swampy land, beside the hot springs, Circle Springs, no. 404.

Prunella vulgaris L., var. lanceolata (Barton) Fernald, forma iodocalyx Fern. in Rhodora **15**: 179–186 (1913). Fairbanks, no. 403.

Linaria vulgaris Hill. In waste land, probably a garden escape. Fairbanks, nos. 405, 1058.

Veronica alpina L., var. unalaschcensis Cham. & Schlecht. *V. Wormskjoldii* Roem. & Schult. Rare. A mossy slope at Twelve Mile Summit, on Steese Highway, no. 408. See Fernald in Rhodora **41**: 450 (1939).

V. peregrina L. Waste land. Fairbanks, no. 1068.

Lagotis glauca Gaertn., var. lanceolata Hult. Fl. Kamtch. **4**: 105 (1930). Rare. Near snow patch on Eagle Summit, no. 836.

Castilleja hyperborea Pennell in Proc. Acad. Nat. Sci. Phil. **86**: 532 (1934). Eagle Summit, nos. 411 and 828.

C. pallida (L.) Spreng., subsp. caudata Pennell. Rapids, no. 1025. One specimen of this collection is yellow-villous and very glandular. Circle Springs, no. 413; Wiseman, no. 412.

C. sp. Other collections of *Castilleja* await further study.

Euphrasia mollis (Ledeb.) Wettst. In a low thicket on a hill behind the Lodge, Rapids, nos. 416, 1026.

E. subarctica Raup in Rhodora **36**: 87–88 (1934). Fairbanks, no. 868.

Pedicularis verticillata L. Occasional in subalpine regions. Park, no. 417; Rapids, no. 418; Wiseman, no. 972.

P. labradorica Wirsing. Common on dry hillsides, not usually in high altitudes. Park, nos. 419, 672; Miller House, no. 831; Circle Springs, no. 420; Wiseman, no. 971.

P. sudetica Willd. Fairly common in tundra. Miller House, no. 829; along road to Eagle Summit, no. 422.

P. Oederi Vahl. Abundant in wet ground below snow banks at base of Eagle Summit, but not seen elsewhere, nos. 421, 833.

P. Langsdorffii Fisch. Park, no. 670; Eagle Summit, nos. 423, 834.

A striking alpine Pedicularis with tall thick pink spikes. Rarely reported from the Interior.

P. lanata Cham. & Schlecht. Rare. Eagle Summit, nos. 424, 832.

Reported by Porsild in Rhodora **41**: 287 (1939), from the Alaska Range. Probably second record for the Interior.

P. capitata Adams. On dry stony slopes, occasional in alpine regions. Park, no. 671; Eagle Summit, nos. 425, 830.

Boschniakia rossica (Cham. & Schlecht.) B. Fedtsch. Rapids, no. 427; Wiseman, no. 973, where it was very abundant.

A strange looking plant, parasitic on roots of alder and spruce, growing in woods and thickets. It has a wide distribution in Alaska, as I saw it also in Seward. The Eskimo children called the plants "corn pipes."

PINGUICULA VULGARIS L. Many of the leaf rosettes were seen in a marsh in Wiseman, but I failed to collect them.

PLANTAGO MAJOR L., var. ASIATICA (L.) Decaisne. Circle Springs, no. 428.

GALIUM BOREALE L. Very common in dry soil on banks of streams and rivers in low areas. Fairbanks, no. 867; Circle Springs, no. 431.

A tall, showy Galium with many white flowers in compact panicles.

G. TRIFIDUM L. In moist places near Circle Hot Springs, no. 434.

VIBURNUM PAUCIFLORUM Raf. Very common in thickets along rivers. Rapids, no. 1016; Circle Springs, no. 439.

The red fruit of this tall straggling shrub, often called "High-bush Cranberry," is much prized for jellies and pies.

LINNAEA BOREALIS L. Specimens from Wiseman, nos. 437 and 974, belong to the typical form. See Fernald in RHODORA **24**: 210 (1922).

L. BOREALIS L., var. AMERICANA (Forbes) Rehder. Plants from Miller House, no. 837, have the funnel-shaped corollas. Common in rich woods and shaded thickets.

VALERIANA CAPITATA Pall. A common characteristic plant of moist meadows and subalpine tundra. Park, nos. 441, 674; Wiseman, no. 975.

CAMPANULA LASIOCARPA Cham. A handsome alpine species, called familiarly "Bluebells," growing in large clumps in gravelly soil. Common in the Interior. Park, no. 442; Rapids, no. 444; Eagle Summit, nos. 443, 839; Wiseman, no. 976.

C. UNIFLORA L. Rare in the mountains, but no doubt easily overlooked. My only collection was from Eagle Summit, no. 840.

SOLIDAGO MULTIRADIATA Ait. The most common and abundant Solidago with wide-spread distribution in dry soil. Park, no. 445. Rapids, no. 448, 1033; Circle Springs, no. 447; Wiseman, nos. 446, 977.

S. DECUMBENS Greene, var. OREOPHILA (Rydb.) Fernald in RHODORA **38**: 201–204 (1936). Occasional on sandy banks. Miller House, no. 841; Eagle, on Yukon River, no. 449.

S. LEPIDA DC., var. ELONGATA (Nutt.) Fernald in RHODORA **17**: 8–10 (1915). Along the Chena River, Fairbanks, nos. 451, 870.

Apparently the second record for the Interior.

ASTER JUNCEUS Ait. Circle Springs, no. 455.

Reported but twice previously from Alaska.

A. SIBIRICUS L. Very common throughout the region, especially on sandy banks of streams. Park, no. 453; Rapids, no. 1027; Fairbanks, no. 1059; along Yukon River, no. 454; Wiseman, nos. 456, 978.

Erigeron elatus Greene. *E. acris* L., var. *arcuans* Fernald. See Rhodora **40**: 347 (1938). Wiseman, no. 980.

E. angulosus Gaudin, var. kamtschaticus (DC.) Hara in Rhodora **41**: 389. *E. elongatus* Ledeb. *E. acris* L., var. *asteroides* of Am. Auth. Very common in subalpine regions. Rapids, nos. 458, 1028; Miller House, no. 843; Wiseman, nos. 457, 979.

E. lonchophyllus Hook. In a sandy location not far from the Chena River, no. 1064.

Apparently rare, as only other reports are from Fairbanks.

E. compositus Pursh, var. trifidus (Hook.) Gray. Probably occasional in high mountains. On a rock pile near Sable Pass in Park, no. 676-a.

Tufted with finely cut leaves and white flowers.

E. salsuginosus (Richards.) Gray. Along the Yukon River in thickets, Tanana, no. 460.

E. caespitosus Nutt. Along the Yukon River, no. 461.

E. radicatus Hook. Park, no. 676; Eagle Camp, nos. 459, 696.

Low, caespitose, with strong tap-root, growing in rocks. Similar in appearance, but in the Park specimen the leaves are less linear and inclined to be slightly lobed and base of heads more villous.

Antennaria philonipha A. E. Porsild in Rhodora **41**: 294, pl. 554 (1939). Park, no. 678.

This alpine species, recently named and described, differs from *A. monocephala*, its nearest relative, according to Porsild l. c. "by the thinner tomentum of leaves, the elongated offsets, tall and slender stems and by the larger pistillate heads." It has a wide range from the Bering Sea, the mountains of interior Alaska and Yukon Territory to the Arctic coast east of Mackenzie.

A. alaskana Malte in Rhodora **36**: 107 (1934). Rare in bleak, exposed gravelly places on high mountains. Eagle Summit, no. 464; on the very top of Porcupine Dome, no. 845.

A. Laingii A. E. Porsild in Rhodora **41**: 293 with pl. 554 (1939). Dry gravelly location near the Savage River, Park, no. 677 (mentioned by Porsild).

"By its densely matted growth, the very leafy stems and compact glomerulate ivory-white heads, it differs strikingly from all other boreal Antennarias" Porsild l. c. The type was collected by *H. M. Laing* at the head of the Chitina River. My specimens constitute the second record for this species.

A. pulcherrima (Hook.) Greene. This attractive Antennaria, often 15 inches high, grew abundantly in low open woods near the Koyukuk River, Wiseman, nos. 463, 982.

Rarely reported from Alaska. This is probably the second record.

ACHILLEA BOREALIS Bong. Very common throughout the Interior, especially along rivers. Rapids, nos. 468, 1036; Fairbanks, no. 1063; Rampart, on the Yukon, no. 469.

A. OCCIDENTALIS Raf. Fairbanks, no. 1061.

A. SIBIRICA Ledeb. *A. multiflora* Hook. Occasional on river banks. Fairbanks, no. 1062.

Leaves only pinnately divided.

MATRICARIA MATRICARIOIDES (Less.) Porter. *M. suaveolens* (Pursh) Buch. Common around settlements. Fairbanks, no. 475; Wiseman, no. 987.

ARTEMISIA BOREALIS Pall. Found growing plentifully on a steep, rocky hill near Gunnysack Creek, Rapids, nos. 447, 1034. A rare species in interior Alaska.

A. ARCTICA Less. Common on damp, mossy ledges of high mountains. An Asiatic-Western American species. Eagle Summit, nos. 478, 846; Porcupine Dome, no. 847.

A. FRIGIDA Willd. Occasional on dry hillsides. Fairbanks, no. 1066.

A. ALASKANA Rydb. in N. A. Flora **34**: 281 (1916). Gravel bars of a creek in Wiseman, no. 984.

These match the photograph of Rydberg's TYPE SPECIMEN in Gray Herbarium, collected by I. C. Russell on Yukon River between Nulato and Nowikakat, July 23–27, 1889. The second report for this species.

A. TILESII Ledeb. sens. lat. Very variable. Several specimens resemble var. UNALASCHCENSIS Besser (var. *elatior* Torr. & Gray). Common around roadhouses and towns. Park, no. 480; Rapids, nos. 482, 1035; Miller House, no. 848; Wiseman, nos. 481, 983.

PETASITES FRIGIDUS (L.) Fries. Common in alpine meadows and tundra. Park (in flower), no. 685; Wiseman (basal leaves only), no. 988.

ARNICA ATTENUATA Greene. A tall plant with strongly attenuated leaves, common in thickets and on dry hillsides in subalpine regions. Park, no. 681; Miller House, no. 849; along Yukon River, no. 483.

A. LOUISEANA Farr. Park, no. 679; on slopes of Eagle Summit. no. 850.

A Cordilleran species found at Lake Louise and other locations in the Canadian Rockies, in the mountains of interior Alaska, and the Gaspé Peninsula and western Newfoundland. See Fernald in RHODORA **35**: 368, pl. 270 (1933).

A. LESSINGII Greene. See Hultén, Fl. Kamtch. **4**: 193, pl. 6 (1930). Close beside the preceding species on Eagle Summit, nos. 486, 851. Also in the Park, no. 485.

An Asiatic-Western American Arnica, with pale yellow ligules, brownish pappus and nodding heads.

A. sp.? Resembles *A. Louiseana*, but the rays unusually long for that species. Miller House, no. 850-a.

Senecio vulgaris L. Probably introduced. Rapids, no. 1030.

S. palustris (L.) Hook. In wet places in the mining dumps after the ground has been thawed by water pipes. Fox and Ester Creeks near Fairbanks, no. 488.

Conspicuous and tall, often 3 to 4 feet high.

S. lugens Richards. Abundant in thickets, along roadsides in lowlands and subalpine regions. Park, no. 492; Rapids, nos. 493, 1032; Fairbanks, no. 494; Miller House, no. 853; Wiseman, no. 985.

Tall and weedy, characterized by the black-tipped bracts of the involucre.

S. pauperculus Michx. Fairbanks, no. 491.

S. frigidus (Richards.) Less. *Cineraria frigida* Richards. Occasional in the mountains. Park, nos. 682, 683.

S. Kjellmanii A. E. Porsild in Rhodora **41**: 299 (1939). *Cineraria frigida* Richards., f. *tomentosa* Kjellm. Growing in moist places beneath snow patches on Eagle Summit, nos. 854, 855.

The heads are larger in this species, rootstock stouter, and whole plant woolly and tomentose. Rare in high mountains.

S. atropurpureus (Ledeb.) Fedtsch. in Fedtsch. & Fler. Fl. Eur. Russ. 992 (1910). *Cineraria atropurpurea* Ledeb.; *S. integrifolius* Kjellm. Eagle Summit, nos. 496, 856; Porcupine Dome, 856-a.

A striking plant with orange rays and stem and leaves gray with lanate wool, found commonly on the mountain slopes and dry alpine tundra in the Eagle Summit region. Usually a number of heads in a cluster, but several plants were collected at higher altitudes with a larger single head.

There is a resemblance between this species and specimens in the Gray Herbarium of *S. pyroglossus* Kar. & Kir. from the mountains of the northwestern part of Mongolia.

S. resedifolius Less. See Fernald in Rhodora **26**: 113–116 (1924), and Mem. Gray Herb. **2**: 259 (1925), for map of general distribution. Rare in the mountains. Eagle Summit, no. 852.

S. conterminus Greenm. On stony ground near the Big Delta River at Rapids, nos. 490, 1031.

Saussurea angustifolia DC. Fairly common in dry gravelly places and subalpine tundra of interior valleys. Park, no. 498; Miller House, no. 858; Circle Springs, no. 499.

S. ? monticola Richards. Wiseman, no. 986.

A tall plant, with the heads longer-peduncled. Similar to *S. remotiflora* Rydb. These three have been grouped under *S. alpina*, and more recently under *S. angustifolia* sens. lat., but at least *S. densa* seems distinct in the field.

S. DENSA (Hook.) Rydb. Eagle Summit, nos. 497, 857.

Low alpine plant with heads in a close cluster.

CREPIS NANA Richards. *Youngia nana* (Richards.) Rydb. Occasional in dry soil on alpine slopes. Park, nos. 505, 684; Rapids, nos. 506, 1029; Wiseman, no. 989.

Low and tufted, often stemless.

C. ELEGANS Hook. Apparently rare, but abundant at Miller House, in the piles of stones thrown out by placer mining, nos. 507, 859.

A taller plant, many-stemmed with a long tap-root.

TARAXACUM MUTILUM Greene. (Group *Ceratophora* Dahlst.) (determinavit G. Haglund 1938). Wiseman, no. 990.

T. KJELLMANII Dahlst. ("verosimiliter") (Group *Vulgaria* Dahlst.). Fairbanks, no. 1065.

T. KAMTCHATICUM Dahlst. (Group *Glabra* Dahlst.). Park, no. 686.

LACTUCA SCARIOLA L. Introduced. Miller House, no. 508.

L. PULCHELLA (Pursh) DC. Along Yukon River, no. 509.

THE STATUS OF CHAMAECYPARIS THYOIDES IN MAINE.—*Chamaecyparis thyoides* L., an Atlantic Coastal Plains species, has been of interest to Maine botanists since Dr. M. L. Fernald[1] pointed out that no specimens of the tree collected in Maine were known, although it had been reported from Kittery by Dr. G. L. Goodale. In August, 1916, however, "the remains of a once large area of *Chamaecyparis*" were found in the towns of Alfred and Lyman;[2] and in 1936 Dr. Anne Perkins[3] reported an extensive stand in Sanford, York County. Rossbach[4] discovered a small stand of stunted trees in a cold sphagnum bog at Knight's Ponds, Northport, Waldo County in the Penobscot Valley. He also reported the plant in the same region in Appleton, Knox County. Botanists of the University of Maine have inspected a stand of the species in Appleton, and have found it to be somewhat extensive and consisting of tall, vigorous trees equal to the best stand observed in York County.

[1] Fernald, RHODORA **5**: 203, 1903. [2] Norton, Bull. Josselyn Bot. Soc. no. **6**: 7, 1920.
[3] Perkins, RHODORA **38**: 452, 1936. [4] Rossbach, RHODORA **38**: 453, 1936.

On July 21, 1939, the writer, accompanied by Dr. R. H. True, found an extensive stand in Berwick, Maine. An estimate of the total acreage of *Chamaecyparis thyoides* in York County approaches 1000 acres. Botanists exploring bogs and cedar swamps in the coastal area between Kittery and the Penobscot Valley may well keep the tree in mind.—OLIVER M. NEAL, JR., Michigan State College.

TRAVELS OF ASA GRAY IN WESTERN VIRGINIA, 1843*

EARL L. CORE

In August, 1843, Asa Gray traversed the mountains of what is now West Virginia in the course of one of his expeditions to the Southern Appalachians, large portions of which were then relatively unknown botanically. Although several interesting discoveries marked his progress, his journal for this period is comparatively barren, alongside the detailed records of his explorations farther south in North Carolina. Millspaugh[1] reports that he was unable to trace his route through the State. Nevertheless, from the labels on some of his collections, from our knowledge of the highways existing in that day, and from the scanty references in his writings, it has been possible to outline his travels in this area with a considerable degree of accuracy.

Dr. Gray's first journey to the Southern Appalachians was made in 1841, a report of which was published in the American Journal of Science, in the form of a letter to Sir William Hooker.[2]

Although he expected to make many such southern expeditions (see his letter to W. J. Hooker, May 30, 1840), he was prevented from undertaking them because of the time required for the Flora of North America.[3] The new territories west of the Mississippi were being opened to exploration and for many years continually yielded an immense amount of new botanical material. Torrey and Gray interested themselves in the various

* Contribution No. 13 from the Herbarium of West Virginia University.

[1] W. Va. Geol. Surv. **5** (A): 4. 1913.

[2] Amer. Jour. Sci. Ser. 1. **42**: 1–49. 1841.

[3] A Flora of North America; containing abridged descriptions of all the known indigenous and naturalized plants growing north of Mexico; arranged according to the natural system. By John Torrey and Asa Gray. New York. 8vo; **1**: 1838–1840, pp. xvi + 711; **2**: 1841–1843, pp. 504.

expeditions, boundary surveys, and the like, and were constantly hard at work studying the collections that came in.

On April 30, 1842 Dr. Gray was appointed to the Fisher professorship of Natural History in Harvard College, removing in July to Cambridge, where, in addition to his teaching duties, he continued his research and writing, busier than ever. However, in the summer of 1843, with the sanction of the president and board of the college (see letter to Mrs. Torrey, July 22, 1843), he found time to break away from his work long enough to make the second of his southern tours.

He left Cambridge on August 11 for New York, from there proceeding to "the Alleghany Mountains in the north of Virginia", where he was to meet his friend, William Starling Sullivant, of Columbus, Ohio. The chief object of the expedition, from Dr. Gray's standpoint, was to "obtain live plants and seeds"; they expected to be too late in the season for the best botanizing, although he thought that he should "be in the best time for Compositae". Mr. Sullivant planned to devote "his attention primarily to the Musci"; between the two of them, they hoped to "let nothing escape".[4]

The expedition lasted nearly three months (Gray returned to Cambridge on November 3),[5] but while "the later and more interesting part" of the journey, in North Carolina, receives several pages of mention in letters and entries in his journal, the "long journey through Virginia" is dismissed in a more summary fashion. Sullivant was a pleasant companion and Gray recalled, years later, "the varied incidents of the arduous but delightful journey, ... the laborious mountain ascents, the night bivouacs, the healthful woodland life and primitive fare, and the many amusing adventures" of the tour which took them "along the principal length of the Alleghany Mountains, through much of their most picturesque scenery, and through regions which abound with the choicest botanical treasures which the country affords".[6]

Late in August the two friends met, apparently somewhere in the highlands of Western Maryland. Following the National Road (now U. S. Route 40) west from the Potomac at Cumber-

[4] Letter to W. J. Hooker, 11th August, 1843.
[5] See letter to George Engelmann, November 4, 1843.
[6] Amer. Jour. Sci. ser. 2. **1**: 79. 1846.

land, "the Great Back Bone of the Alleghanies was crossed in Maryland, where it presents a pretty formidable elevation,[7] and several plants were observed which were thought to be confined to a more southern range, such as *Menziesia globularis* and *Galium latifolium*. The open *glades* on the other side presented many features of Kentucky vegetation".[8]

Leaving the National Road, probably at what is now known as Keyser's Ridge, the two explorers proceeded southwards through Oakland, Maryland, and entered Virginia "near Mount Carmel Town", in Preston County. From this point they descended via Horse Shoe Run to Cheat River at or near Westernford,[9] in Randolph County, thence to Tygarts Valley River. Their course through this "rude, wild region" must have been in general that now followed by U. S. Route 219.

After ascending the beautiful Tygarts Valley, years later the happy hunting ground for Millspaugh,[10] "the high Cheat Mountain was then traversed nearly where it merges in the Green Brier range, and *Angelica Curtisii*, Buckl., as well as *Aconitum reclinatum*, Gray, were first met with".[11] It is an interesting observation to note that in Robinson and Fernald's 7th edition of Gray's Manual, published in 1908, the range of *Aconitum reclinatum* is given as "Cheat Mt., Va., and southwards in the Alleghenies"[12] despite the fact that the point at which Gray collected the plant, on Cheat Mt., had been West Virginia territory for nearly half a century. Rydberg's *A. vaccarum*,[13] based on a plant he collected near Spruce Knob, in Pendleton County, West Virginia, is a representative of this species and should be so called. The only other known station for the plant in West Virginia is at Spruce, on the headwaters of Cheat River, in Pocahontas County. The present known distribution of *Angelica Curtisii* in West Virginia may be indicated as follows: Pendleton County: Spruce Knob, *Mr. and*

[7] The elevation is 2860 ft. at the point U. S. Route 40 crosses Big Savage Mt., as the northeastern continuation of Backbone Mt. is now called.

[8] Amer. Jour. Sci. ser. 2. **1**: 79. 1846.

[9] Later St. George, which became the county seat of Tucker County when that county was separated from Randolph in 1856. Parsons, the present county seat, did not then exist.

[10] See Core, Contributions of Charles Frederick Millspaugh to the Botany of West Virginia. Proc. W. Va. Acad. Sci. **8**: 82–93. 1935.

[11] Amer. Jour. Sci. ser. 2. **1**: 80. 1846.

[12] Manual, p. 407.

[13] Torreya **26**: 31. pl. 1. 1926.

Map of West Virginia
Showing Routes of Asa Gray, 1843
1. Mount Carmel Town
1a. Cheat Mountain
2. Traveler's Repose
3. Huntersville
4. Warm Springs
5. White Sulphur Springs
6. Pearisburg

Mrs. Davis; Pocahontas County: Cass, *W. V. U. Bot. Exped.;* Grant County: Gormania, *Core* 3716.

In their trip across "the high Cheat Mountain",[14] the two travellers were benefited by the recently completed section of the Staunton and Parkersburg Turnpike traversing that area. This highway was authorized by an act of the Virginia Legislature in 1823, but appropriations were slow in following the authorization and it was not until 1842 that the road was extended down the Tygarts Valley River through Beverly, then the county seat of Randolph County. The splendid grades[15] of the Turnpike through the unbroken forest of Cheat Mountain must have made the penetration of this remote region quite easy indeed. Their "way crossed a towering range, hung above a far veil of unbroken spruce, forded swift glittering streams, and followed a road that passed rare isolated dwellings, dominating rocky and precarious patches and hills of cultivation".[16]

Eighteen years later, in the fall of 1861, Confederate and Union forces were marching and countermarching along this highway in the War between the States and a Union camp on the summit of Cheat Mountain was the highest point occupied by soldiers during the War. "The celebrated Battle Above the Clouds, on Lookout Mountain, was not one-half so high".[17]

East of the mountain, Gray and Sullivant descended to the Greenbrier River, the region of Hergesheimer's "Tol'able David," into a valley which "extended in deep green pastures and sparkling water between two high mountainous walls drawn across east and west. In the morning the rising sun cast long delicate shadows on one side; at evening the shadow troops lengthened across the emerald valley from the other".[18]

It is likely that the two travellers spent an August night at the far-famed hostelry, Traveller's Repose. This old Tavern

[14] Cheat Mountain has an elevation of 3798 ft. at the point traversed by the Turnpike, and 4433 ft. at Barton Knob, overlooking the Turnpike.

[15] This section was located by Claudius Crozet, who was formerly a surveyor on the staff of Napoleon Bonaparte, and it is a splendid commentary on his ability that modern engineers, laying out the course of U. S. Route 250 across Cheat Mountain, did not diverge from Crozet's survey at a single point along the 3-mile ascent of the western slope. See I. F. Boughter, "Internal Improvements in Northwestern Virginia," pp. 189–193, 205–214.

[16] From "Tol'able David." This description is applied by Hergesheimer to the next range to the east, Alleghany Mountain, but is applicable here as well.

[17] Hu Maxwell, "History of Randolph County," p. 140.

[18] From "Tol'able David."

was established before 1800 by John Yeager and in 1843, under the management of Andrew, John's son, was in the midst of one of its busiest periods, as a regular stage-coach stop and tavern house on the newly completed Turnpike. This highway was heavily used by emigrants going west and by statesmen from the west going to and from Washington and Richmond. It is said that Abraham Lincoln, when a Congressman from Illinois, used to stop at this house. The building was burned by Federal troops in 1861. The old tavern register, probably bearing the names of Asa Gray and W. S. Sullivant, likewise went up in the flames.[19]

Instead of proceeding eastward along the route of the Staunton and Parkersburg Turnpike, across Alleghany Mountain, the two botanists here turned to the south, towards the little hamlet of Huntersville, then the county seat of Pocahontas County. "In the journey through Pocahontas County to Huntersville, fruiting specimens of the little known *Rhamnus parvifolius* Torr. and Gr. Fl., were collected, a species which proves to be a perfectly distinct one, and has also been found by Mr. Buckley in Alabama".[20] Trelease later decided, however, that *Rhamnus parvifolius* should appear as a synonym of *R. lanceolata* Pursh.[21] Other known stations for this rare plant in West Virginia now include: Hampshire County: shale barren near Junction, *Strausbaugh;* Pendleton County: Smoke Hole, *Core* 4324.

Huntersville in 1843 "was by common consent regarded as a little place with large ways. It was no uncommon thing for Huntersville merchants to realize three or four hundred per cent on dry goods, and not much less on groceries",[22] dispensing to hunters and settlers who came to town.

Turning again eastwards near Huntersville, Gray and Sullivant once more enjoyed the privilege of traversing a recently built thoroughfare, the Warm Springs and Huntersville Turnpike, completed about 1838. "It was a grand highway for that period, and awoke a sensation much like our people felt at seeing cars coming to Marlinton. Every stream was bridged from Hunters-

[19] Pocahontas Times, January 25, 1940; an excellent article by Calvin Price on the history of Traveller's Repose.

[20] Amer. Jour. Sci. ser. 2. **1**: 80. 1846.

[21] Syn. Fl. N. Am. **1**: pt. 1, 407. 1895–1897.

[22] Wm. T. Price, "Historical Sketches of Pocahontas County," p. 587.

ville to the Warm Springs, and the means of communication at the time between those places seemed to be all that was desired or could be reasonably expected".[23]

"In the route eastward across the mountains from Huntersville to the Warm Springs, the rare *Helianthus laevigatus*, Torr. and Gr., and *Andromeda floribunda*, Pursh., (which is *A. montana* of Buckley,) were abundantly found. A mountain meadow on Nap's [Knapp's] Creek, east of Huntersville, also furnished a stout *Gentian* with crowded ochroleucous flowers, and with much the habit of *G. Andrewsii*. It was naturally enough confounded with *G. ochroleuca*, and specimens have been distributed under this name. It is, however, quite a different species from the real *G. ochroleuca*, though it may be the plant figured under that name in Sims. Bot. Mag. t. 1551, as well as the form mentioned by Grisebach (in Hook. fl. Bor. Am.) as remarkable for its cordate-lanceolate leaves".[24] Temporary diagnostic characters were given for the new species, and it was named *G. flavida*. No mention is made in Gray's account of the extensive shale barrens between Huntersville and Warm Springs, nor of the interesting species now known to inhabit the barrens.

Other stations of *Helianthus laevigatus* in West Virginia, represented by specimens in the State Herbarium, include: Hardy County: South Branch Mountain, *Sharp;* Greenbrier County: Kate's Mountain, *W. V. U. Bot. Exped.;* Mineral County: Wild Meadow Run, *W. V. U. Bot. Exped.* *Andromeda floribunda* is still little known in West Virginia, although abundant enough in localities where it does occur. The distribution may be given as follows: Greenbrier County: Alleghany Mountains, *Hopkins*, Pendleton County: Top of Shenandoah Mountain, *Core* 4895; Pocahontas County: near Cass, *Fred W. Gray.* In addition to the Pocahontas County station, *Gentiana flavida* is now known from Greenbrier County, near White Sulphur Springs, where it was collected by Ben R. Roller.

"From the Warm Springs the expedition pursued its course, by way of the Hot Springs[25] and the white Sulphur Springs, along

[23] Ibid., p. 73.

[24] Amer. Jour. Sci. ser. 2. 1: 80. 1846.

[25] Their course in general must have followed the present U. S. Route 220 to Covington, thence U. S. Route 60 to White Sulphur Springs, thence U. S. Route 219 through Union, Salt Sulphur Springs, and Red Sulphur Springs.

the base of Peter's Mountain to the Kanawha [New] River, which was crossed at Toney's Ferry below Parisburg [Pearisburg], and thence to Tazewell county. In Giles County, soon after crossing the river, live roots of the very rare and distinct *Heuchera hispida*, Pursh, were obtained, which have been preserved in cultivation."[26]

Summarizing, in a letter to John Torrey, written at Asheville, North Carolina, on September 30, Gray says: "Our long journey through Virginia brought us behind our estimated time, and hurried the later and more interesting part of our operations . . . . I doubt if I got anything of much interest in Virginia, except Buckley's (and Nuttall's) *Andromeda, Rhamnus parvifolius* on the waters of Greenbrier (where did Pursh get it?), *Heuchera pubescens* in fruit and *Heuchera hispida* Pursh ! ! out of flower and fruit, so that I detected it by the leaves only (and got good roots), not far from where Pursh discovered it, but more west, on the frontiers of a range of mountains where this very local species doubtless abounds".[27]

The Bryophytic results of the expedition appeared in the form of a few privately distributed books which contained actual specimens of mosses collected by Sullivant and his friends. The complete title of this work was "Musci Alleghaniensis, sive Spicilegia Muscorum atque Hepaticarum quos in itinere a Marylandia usque ad Georgiam per tractus Montium A. D. MDCCCXLIII, decerpserunt Asa Gray et W. S. Sullivant: (interjectis nonnullis aliunde collectis) Cincinnavit et exposuit W. S. Sullivant. Fascis I, II, Columbus in Ohione MDCCCXLV."

West Virginia University,
Morgantown

[26] Amer. Jour. Sci. ser. 2. **1**: 81. 1846.
[27] See Wherry, "Heuchera hispida Pursh rediscovered." Rhodora **35**: 118, 119. 1933.

POLLINATION OF THE ERICACEAE: V. GAYLUSSACIA BACCATA[1]

Harvey B. Lovell

Gaylussacia baccata (Wang.) Koch, the black huckleberry, is an extremely common shrub in sterile pastures and granitic hillsides of southern Maine where it grows in the most unfavorable of locations. The flowers are grouped in one-sided racemes on the wood of the previous season. At the time of blooming in June the new growth, already several inches in length, is rapidly concealing the flower clusters from above. The number of flowers in an inflorescence is from 3 to 8, the average of 26 being 6.02, and the number of racemes on a branch was found to range from 3 to 8.

The flowers vary from dark red to light pink. Both the pedicels and the two bractlets are reddish as are the bracts. The latter, however, are early deciduous, only an occasional one being found persistent at the time of anthesis.

The tapering corolla is from 5.5 mm. to 6.5 mm. in length. It narrows slightly at the mouth leaving an opening only 1.5 mm. in diameter which is partially filled by the round capitate stigma. Like the foliage both the calyx and outside of the corolla are covered with globules of waxy secretion.

The pistil consists of an inferior 10-celled ovary bearing on its apical surface a thick, fleshy nectary (Fig. 1, C) which surrounds the base of the style. The very glutinous stigma is obscurely five-lobed (Fig. 1, B).

The yellow anthers terminate in long tubes which open by elongated pores (Fig. 1, D). The broad, flat filaments with the aid of their ciliate margins form a collar around the nectary.

The flowers were found to vary in size and shape between two extremes. The more common type was long, slender and tapering with the stigma exactly in the mouth of the corolla (Fig. 1, F). The other type was shorter and broader with the stigma slightly exserted (Fig. 1, E). Similar variations in size have been reported in *Vaccinium vitis-idaea* by Warnstorf and also by Warming.[2]

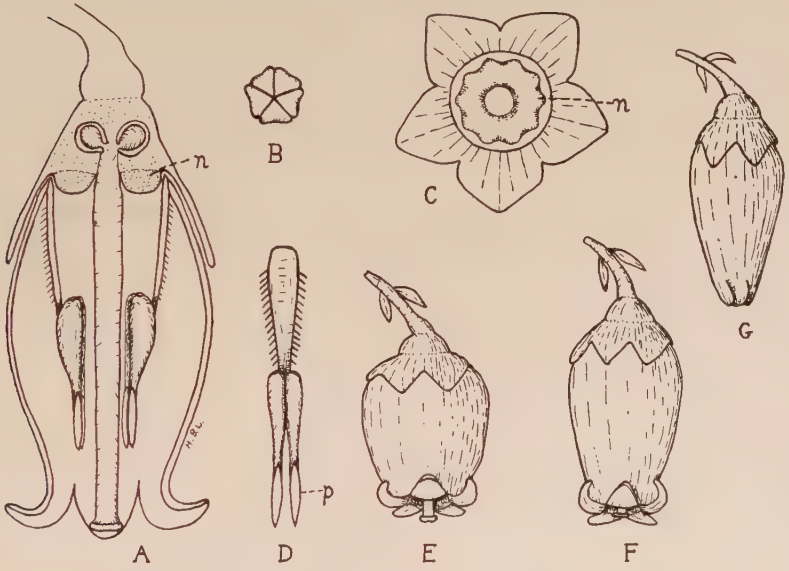
The flowers are homogamous. In mature buds beginning to open, the stigma was already glutinous, the anther pores open and the

[1] Contribution from the Biology Department, University of Louisville.

[2] Knuth, P. and J. R. Ainsworth Davis. Handbook of Flower Pollination, p. 30, 1909.

pollen mature. Anthesis lasts for several days at the conclusion of which the corolla and stamens fall off together. The style persists a little longer.

Usually nectar secretion is rather scanty, a few drops being present on the nectary near the base of the style. After a rainy night many flowers were found to have secreted from one to two mm. of nectar which was held in place in the center of the flower by the filaments. Old flowers, which could be recognized by their easily dislodged



corollas, were entirely devoid of nectar. This shows that nectar secretion ceases entirely soon after fertilization. By the afternoon of the same day, a warm sunny day, nearly all the nectar had disappeared. Flowers kept for 40 hours in a cool, damp cellar accumulated as much as 4 mm. of nectar. That this was not condensation of moisture was shown by the fact that old flowers again contained no nectar.

The flowers have a slightly sweetish odor.

Pollination of the flowers is accomplished chiefly by Andrenid and honeybees, but the number of visits received by the flowers was small. Insect visitors must pass their tongues between the style and anthers, thus shaking the pollen onto their faces. When such an insect visits

the next flower, the pollen-covered parts strike the protruding stigma on the glutinous surface of which pollen clings readily, completing the process of cross-pollination. Nearly all the stigmas examined had pollen clinging to them.

In the absence of insect visits pollen falling from the anther tubes is almost certain to strike the glutinous stigma. In order to determine whether self-pollination results in a set of fruit, five plants, bearing respectively 26, 27, 16, 12, and 30 buds were covered with cheese cloth bags on June 21. When examined on Aug. 22, not a single fruit was found. One plant had died but the others had grown vigorously. The set of fruit on the neighboring plants was rather light due probably to the paucity of insect visits but many plants had set from two to five berries. The evidence indicates that *Gaylussacia baccata* is self-sterile and entirely dependent upon insects for cross-pollination.

The following insects were sucking nectar except where otherwise indicated. All insects were collected at Waldoboro, Maine, from June 15 to June 21.

HYMENOPTERA. APOIDEA: *Apis mellifera* L. ♀, *Andrena vicina* Smith ♀, *A. lata* Viereck ♀, collecting pollen, *Nomada cuneata* Robt. ♀.
LEPIDOPTERA. NYMPHALIDAE: *Brenthis myrina* Cr.; LYCAENIDAE: *Incisalia niphon* Hbn.
THYSANOPTERA. *Thrips sp.*, common wandering around in flowers.

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Volume 42, no. 500, including pages 277–308 and plates 606–625, was issued 13 August, 1940.

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